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University of Dundee
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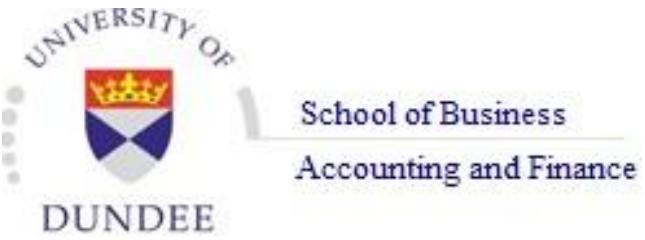

The Capital Investment Appraisal Process: The Case of Libya

Moftah M. A. Mohammed

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Fulfilment of the Requirements for the Award of the
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The source Sham-Cafe-Net (2013)

In the name of Allah, the most beneficent, the most merciful.

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Dedication

To my parents,

my dear brothers 'Abdelkrim and AdeL',

my wife, my kids, my extended family,

my relatives and my friends,

who always give me their wonderful love,

their unlimited support and their sincere

prayers.

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Abbreviations

A	Academic
AMT	Advanced Manufacturing Technology
APV	Adjusted Present Value
ARR	Accounting Rate of Return
ASU	Arab Socialist Union
BEA	Break-Even Analysis
BET	Beta Analysis
C	Company
CA	Chartered Accountant
CB	Commercial Bank
CEO	Chief Executive Officer
CFO	Chief Financial Officer
DCF	Discount Cash Flow
DTA	Decision Tree Analysis
ESM	Egyptian Stock Market
EVA	Economic Value Added
FF	Financial Firms
FI	Food Industry
GCC	Gulf Cooperation Council: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
GPC	General People's Congress
HC Dep.	Head of Credit Department
HI Dep.	Head of Investment Department
HIA	Head of Internal Audit
ICT	Information Communication Technology
IF	Islamic Finance
IR	Interest Rate
IRR	Internal Rate of Return
IT	Information Technology
JSE	Johannesburg Securities Exchange
LSM	Libyan Stock Market
M	Mixed
MENA	Middle East and North Africa
MF	Manufacturing Firms
MIRR	Modified Internal Rate of Return
N	National Capital
NIS	New Institutional Sociology
NOC	National Oil Corporation
NPV	Net Present Value
NSE	Nigerian Stock Exchange
OBJ	Objectively
OG	Oil and Gas
P	Private
PB	Payback
PG Dip.	Postgraduate Diploma
PI	Profitability Index
PVPB	Present Value Payback

R&D	Research and Development
RCC	Revolutionary Command Council
ROCE	Return On Capital Employed
RRR	Rising Required Rate of Return
SB	Specialised Bank
SCE	Scenario Analysis
SEN	Sensitivity Analysis
SF	Service Firms
SO	State-Owned
SPB	Shorten the Payback period
SUB	Subjectively
SVA	Shareholder Value Analysis
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TUT	Third Universal Theory
WACC	Weighted Average Cost of Capital

Acknowledgments

In the beginning, I want to thank Allah for all the blessings bestowed on me: especially, in the context of this research process, the grace to work in the right place and the right time with people who are some of the best academic staff in the world.

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Thank you all whom I have mentioned and to those I maybe have accidentally forgotten.

Declaration

I hereby declare that I am the author of this thesis, that the work of which this thesis is a record has been done by myself, and that is has not previously been accepted for a higher degree.

Signed…… Date…….

Moftah M. A. Mohammed

Certificate

We certify that Moftah M. A. Mohammed has worked the equivalent of three years on this research, and that the conditions of the relevant ordinance and regulation have been fulfilled.

Signed…… Date…….

Professor Bruce Burton

Signed…… Date…….

Professor David Power

Abstract

The Capital Investment Appraisal Process: The Case of Libya

This thesis aims to explore and investigate the state of current investment appraisal practices within Libyan firms. In particular, the thesis attempts to answer four research questions: (1) How do Libyan firms appraise capital investments? (2) Do Libyan firms incorporate risk into their capital investment appraisal processes? (3) Do Libyan firms face capital rationing and, if so, is it externally or internally imposed? and (4) Does the availability of Islamic Finance affect Libyan firms' view of the capital investment appraisal process?

This study is based on a qualitative empirical approach, with a subjectivist orientation but a main concern with the sociology of regulation; the interpretive paradigm is employed in this thesis. Rather than simply providing a simple description of the phenomena under investigation, the aim of this thesis is to interpret and understand the issues surrounding the problem being considered. Thus, this study seeks to establish a better understanding about the nature of the capital investment appraisal process in Libyan corporations, and how it differs across Libyan economic sectors.

In order to provide evidence and contribute to our knowledge about this topic, two research methods, both compatible with the interpretive paradigm and consistent with the methodology and the researcher's beliefs about the topic under investigation, are employed. The research methods used are: (i) a semi-structured

interviews; then (ii) a questionnaire survey based upon the literature review and on the key results from (i). For the former, 20 interviews were conducted, involving two groups: firm-based interviewees (‘insiders’ working in firms) in five economic sectors with different size and ownership structures and ‘outsider’ interviewees (bankers, academics and chartered accountants). In the second phase, 45 questionnaires were collected from firms which operate in five economic sectors, again with various size and ownership patterns.

The main findings indicate that non-financial criteria (e.g. political priorities, State development plan and personal experience) play a more important role than financial factors. While Libyan companies use multiple techniques to appraise capital investments, usage of discounted cash flow techniques (DCF), although increasing is not yet as high as in developed nations, with payback remaining the most popular. The evidence shows that the source of the funding (followed by project size and nature of the project, respectively) also plays a role in choosing the appraisal techniques. Typically, the process of capital investment appraisal in Libya appears to have five stages (determination of budget, research and development, evaluation, authorisation, and monitoring and controlling). Libyan firms consider the first of these as the most important stage. The majority of the respondents employ a post-audit phase of two years or less; about half the sampled firms conduct the post-audit by comparing the actual performance with the feasibility study on which the project was based. The companies consider real options when looking at flexibility, but they have no effect on the choice of the appraisal techniques or the process generally. Similarly, there are no changes in the techniques or the process when advanced manufacturing technology investments are considered.

Regarding risk evaluation, this is mostly subjective although scenario analysis and sensitivity analysis are employed to some extent. Around 50% of the firms calculate the cost of capital, but most of these firms do so subjectively (e.g. via interest rate observations), while the rest use CAPM to calculate the cost of capital. Fewer than one in ten of the firms that calculate the cost of capital employ project-specific rates.

The majority of the companies noted their experience of capital rationing, mostly of the external variety (primarily reflecting State actions). The majority of the firms claimed to be considering the Libyan Stock Market as source of funding, but not in the near future, essentially because of a lack of knowledge among Libyan companies about its functioning.

The findings suggest that use of Islamic finance is not yet common among Libyan firms. However, two thirds of the firms suggested that they would use Islamic financial products to finance their future projects for several reasons; mainly religion, to avoid paying interest or demurrage, plus risk sharing though the use of Islamic financial products such as Musharakah. Those firms, which did not view Islamic finance positively, mentioned the incompatibility of the current products with Islamic Shariah law, suggesting that in reality they are just traditional financial products with Islamic names.

Some notable differences between theory and practice emerged in this research. For instance, certain non-financial criteria (e.g. political priorities) were more important than financial factors. Relatedly, there was evidence of external interested parties

such as academics seeing practice and ideals differently. This type of finding suggests a key contribution of this study as highlighting the need for contextual specificities to be carefully considered when investigating an issue as (theoretically) straight-forward as investment decision-making in practice.

Chapter One

Introduction

1.1 Introduction

Most business enterprises need on-going capital investment in order to survive in the rapidly changing global business environment (Eljelly and Abuidris, 2001). However, this spending tends to be a cause of great concern to management because, of all the decisions that a company will undertake, those relating to capital expenditures are widely recognised as the most important in practice for ensuring the future success of a company (Holmes, 1998; Toit and Pienaar, 2005).

There are a number of other reasons as to why capital investment decisions are important. For instance, the capital investment decision is often impossible, (or very costly) to undo. In addition, capital investments normally have a significant impact on the future cash flows of a company, flows that are the ultimate source of a company's present valuation. The returns on capital investment usually represent a high percentage of the funds available to support future growth within firms (Holmes 1998); if such investments turn out to be unsuccessful, a firm may run into liquidity problems and even financial distress (Argenti, 1977; Keasey and Watson, 1989). The funds allocated to capital investments are normally committed for a lengthy period of time; again, this commitment represents a threat to the liquidity of a firm if not properly planned and managed (Aziz and Lawson, 1989). Finally, it is argued that capital investments have a direct effect on the profitability of companies in the long-term (Andrews and Butler, 1986).

Generally, finance theory recommends that firm managers should only undertake capital investment opportunities that add value to their company. Therefore, firms should undertake all projects with a positive net present value. Financial theories or theoretical treatments of capital budgeting in the 1970s usually tended to regard the manager's personal interest in an investment as a source of bias which had to be

ignored. Thus, they failed to incorporate any agency perspective into their analyses (Jensen and Meckling, 1976). They did not take account of the potential problems faced by managers when they commit themselves to a particular course of action with their selection of a specific project (Pinches, 1982). Thus, they failed to take any account of the undiversified risk faced by a manager (Donaldson, 1963) or the differences in goals, time horizons or funding preferences associated with the separation of ownership from control within large corporations (Byrd et al., 1998). In addition, traditional perspectives on capital investment decision-making also failed to take account of the fact that decision-makers often do not have a complete understanding of the capital budgeting process with all of the uncertainties innately associated with long-horizon projects (Mintzberg et al., 1976).

Over the last three decades, the usage of different capital investment appraisal techniques has become a key concern of the literature in this area and a topic of many empirical studies. These studies have focussed on the issue of why managers fail to heed the recommendations of academics about the techniques which companies should employ when appraising capital investment. In general, they document the popularity of capital investment techniques among firms in different countries (e.g. Akalu, 2001; Remer and Nieto, 1995) and discuss how this popularity has changed over time (Klammer and Walker, 1984; Pike, 1988; Sangster, 1993; Pike, 1996; Pike and and Neale, 2006).

The theory of capital investment decision-making suggests that managers should estimate the value created by a new project. This is achieved by employing discounted cash flow (DCF) techniques and a company's weighted average cost of capital; the net present value (NPV) should be calculated (Gilbert, 2005). The theory suggests that NPVs translate directly into changes in equity value and so

shareholders maximise wealth when all positive NPV projects are undertaken (Fisher, 1930; Hirshleifer, 1958).

However, a number of authors have suggested that NPV and related traditional techniques are incapable of handling the dynamic reality associated with the rapidly changing business environment - particularly if the main goal of investors is to increase shareholders' wealth (Woods and Randall, 1989). A number of studies have highlighted specific limitations of these traditional techniques when they are used in practice to evaluate capital investments (Laitinen, 1997; Lefley, 1997, 2000; Akalu, 2001). Different approaches have been proposed by academics to overcome the limitations associated with the traditional investment appraisal techniques (Lefley and Morgan, 1999; Arnold and Hatzopoulos, 2000; Graham and Harvey, 2001). For example, a number of studies have suggested that real options analysis can be employed to model the abandonment and expansion choices which occur throughout the life of a project (Dixit and Pindyck, 1995; Cho, 1996), whereas other researchers have recommended that value management techniques be used (Rappaport, 1986; Stewart, 1991).

The literature suggests that financial appraisal techniques which are commonly used to evaluate capital investments are unsuitable evaluation tools for analysing certain types of projects; for instance, capital expenditure proposals concerned with the acquisition of advanced manufacturing technology (AMT) and research and development (R&D) (Finnie, 1988; Yeo and Qiu, 2003). Traditional evaluation methods, including DCF techniques have been criticised as inappropriate for some projects such as expenditures on information technology (IT) and R&D; in these circumstances, authors have suggested that a project be selected on the basis of personal experience, intuition and rules of thumb (Ross, 1986; Shank, 1996). The

literature is also critical about the absence of any discussion about the implementation of projects; it points to an overemphasis on the DCF techniques themselves in an environment which is dominated by uncertainties. The emphasis in modern finance textbooks on techniques that assume current data availability and that employ vast computational effort in practice is argued to be inappropriate (Lee, 1988; Cheung, 1993; Abdel-Kader and Dugdale, 1998; Fernandez, 2013). The focus on selecting the appropriate appraisal techniques often ignores important contextual factors such as the type of industry where a firm operates as well as the underlying nature of the project being considered e.g. replacement, environment, statutory-requirement influences (Eppli, 1993; Benson, 1999; Akalu, 2003).

The long-term success of an enterprise depends on the quality of capital expenditure planning and the efficiency of ongoing control over the whole capital budgeting process. The investment process is itself directly affected by the extent to which any techniques used draw on relevant concepts and are applied in a rational fashion. However, the success of a capital investment process in practice depends upon a wide range of factors. The use of investment appraisal techniques within the capital budgeting process faces very real practical difficulties in terms of establishing a clear strategy for an organisation, recognising the various investment opportunities available, forecasting the relevant cash flows associated with different strategies, predicting future changes in the environment within which the enterprise operates, deciding on the organisation's main aim and, finally, implementing any investment plans as well as auditing the actual outcomes achieved (McIntyre and Coulthurst, 1985).

Several macro-level factors will also be relevant; for instance, the type of ownership associated with an organisation: if it is State-owned or private, whether or

not it aims to make a profit. It is commonly assumed that public (State-owned) companies focus more on non-financial factors such as social policy objectives when appraising capital investments. By contrast, private enterprises are usually assumed to concentrate solely on financial factors when deciding upon whether or not to proceed with a specific investment project; they are thought to be less concerned about political, social and other non-financial variables. However, this characterisation of private-sector companies is a little naive; increasingly, academics recognise that such firms have to factor non-financial considerations into their investment plans, due to the influences of customer groups and other stakeholders' interests. However, these are often viewed as secondary concerns (Eljelly and Abuidris, 2001).

Libya is a developing country which stands at the crossroads of Europe and Africa. Its economy has been shaped by many events in the past four decades including dramatic political and economic changes and the absence of a private sector for more than 10 years between the early-1980s and the mid-1990s. From the mid-1990s, another seismic shift took place in the economy of the country as a private sector was permitted to develop by the Government; a stock market was launched and privately-owned banks were granted licences to operate by the Central Bank. These changes occurred, in part, because of Government unwillingness and inability to fund all of the investment that was needed within Libya. Furthermore, the changes arose out of a "political rehabilitation" of the country into the global economy following years of economic sanctions and isolation (Mahmud, 1997; El-shukri, 2007, Masoud, 2009). Whatever the causes, the end of the 1990s saw a sizeable number of firms needing to fund large-scale projects following years of underinvestment. Libyan companies therefore needed to raise funds for capital

investment projects without recourse to State financing or without any need to fit in with the Government's latest plan - a major change in their operating circumstances. Thus, Libya has become an interesting setting in which to study the usage of investment appraisal techniques and assess information about companies' capital budgeting processes. Many of the companies should be embarking on new R&D projects and undertaking major capital investment projects which involve the adoption of AMT and/or IT in order to keep up with this competitive and pressured environment (Lazaridis, 2004). Therefore, they may be asked to use sophisticated financial appraisal techniques in order to justify their proposed capital spending rather than rely on State patronage and Government connections which sufficed in the past (Khamees et al., 2010).

For these reasons, the researcher was motivated to explore and investigate current investment appraisal practices in Libyan firms. A subjective approach was chosen as the main methodology for this study, and the interpretive paradigm used to obtain insights and understandings of existing practice from different groups of participants involved in the capital investment decision-making process. The participants were drawn from both inside and outside different business enterprises in Libya.

1.2 Study Objectives and Research Questions

The objective of this thesis is to explore and investigate capital investment appraisal practices in Libyan companies. Specifically, the thesis explores: (i) what capital investment appraisal techniques (if any) are used, and the role of non-financial factors in the decision about whether or not to proceed with an investment; (ii) whether risk is factored into any appraisal calculations; (iii) whether rationing is experienced by Libyan companies; and (iv) what sources of funding are available to

Libyan firms when financing large capital expenditures and what effect do these have on Libyan firms' views of the capital investment appraisal process. [1]

These issues are considered within an interpretive paradigm. A paradigm based on the sociology of radical change was not thought to be appropriate for an investigation of this topic in the Libyan economic environment which was characterised by (deeply embedded) central planning and control for many years[2]. Moreover, the aim of this thesis is to understand and interpret current practice and issues surrounding the topic being considered, rather than just describing the topic under investigation. Thus, the research aims to: provide a better understanding of the nature of the capital investment appraisal process in Libyan companies at the time of the analysis; consider whether investment appraisal varied across different economic sectors; and examine the perspectives of the different groups involved in the capital investment decision-making process both inside and outside business enterprises. Hence, this research is designed to obtain a relatively deep understanding of the investment appraisal process itself as well as wider related issues. Since the research has a subjective orientation, and is concerned with the sociology of regulation (Burrell and Morgan, 1979), a qualitative approach to the research methods was thought to be appropriate. Therefore, interviews were initially conducted with interested stakeholders in order to develop an understanding of the main issues considered relevant by those closest to the process. A hand-delivered questionnaire was then employed to ascertain whether the interviewee perceptions were more widely held.

[1] At this stage, it should be noted that shortly after the empirical research was completed, a revolution took place in Libya, leading to the death of the former dictator, Muammar Gaddafi, but with civil unrest continuing to this day. However the transition from a State-controlled economy in Libya had begun prior to 2011 and so the results of the study should have particular relevance going forward; as the nation attempts to rebuild and grow its key assets and industries, successful capital expenditure programmes will be key and the analysis here provides evidence as to how such practices were beginning to adapt to the economic changes preceding the uprising.

[2] See Chapter three for more detail about the Libyan economic environment.

To achieve these broader objectives, the study addresses four specific research questions:

RQ1. How do Libyan firms appraise capital Investments?

RQ2. Do Libyan firms incorporate risk into their capital investment appraisal processes?

RQ3. Do Libyan firms face capital rationing and, if so, is it externally or internally imposed?

RQ4. Does the availability of Islamic Finance affect Libyan firms' view of the capital investment appraisal process?

1.3 Scope of the Study

As mentioned in previous sections, this thesis is deliberately qualitative and exploratory in nature. It does not aim to establish specific hypotheses for detailed investigation because the dearth of prior research on this topic for Libyan firms meant that a functionalist research approach was inappropriate. The research aims to deliver a detailed descriptive explanation of the capital investment appraisal process within Libyan firms by examining and interpreting the perceptions of different groups of decision-makers about the theory and current practices of capital investment in a rapidly-changing, developing-country environment. Many of those consulted in the chapters that follow are insiders working within Libyan companies including Chief Executive Officers, Chief Financial Officers and other senior board members. In addition, a number of those outside companies were also consulted; in particular, Bankers (as fund providers), Chartered Accountants (as external financial advisers) and Academics (who teach capital investment appraisal methods to future generations of decision-makers) were interviewed and surveyed. The research

methods used to answer the research questions are: (i) a semi-structured interview which investigates the perspectives of different groups about the capital investment appraisal process in Libya; and (ii) a questionnaire survey that explores the current practices of Libyan companies with a large sample of respondents. In both cases, the analysis highlights any influence that outside groups such as the government, banks and educators might have on capital budgeting within the country as well as differences in investment appraisal processes across different economic sectors, various ownership structures and different size groupings.

The findings of this thesis should help to bridge any the gap in the literature about capital investment appraisal practices in developing countries in general and in African Muslim countries in particular. The evidence should also contribute to knowledge by synthesising the perceptions of different groups of decision-makers (insiders and outsiders) about the capital investment appraisal process, as employed by Libyan companies, at a time of great change; it will help to identify the factors which play an important role in the practice and formulation of capital spending decisions in Libyan businesses as well as providing an explanation of how practice may differ from what is recommended by theory and what is documented in the literature from developed countries. Furthermore, the study will shed some light on the importance of sophisticated methods of capital investment appraisal, and if these methods are used, how their results input into the final capital investment decisions of Libyan firms.

1.4 Thesis Structure

The thesis contains seven chapters. The next chapter reviews the general literature about the capital investment appraisal processes of companies located in both

developed and developing economies. In addition, it summarises the prior research relating to this topic in Africa; the small number of available studies on investment appraisal in Libyan companies is discussed in detail. Chapter 3 provides a more substantive overview of the Libyan context for the proposed study. The chapter supplies general background information about the country, including a geographical overview and historical development; the religious, educational, social, economic and political context which characterise the modern Libyan business environment is provided. Chapter 4 discusses the philosophical assumptions which underpin the theoretical framework adopted; this should allow the reader to see why certain evidence was collected and how the findings were interpreted when explaining their implications. In addition to justifying the research methodology selected, the research paradigm and research methods adopted in this study are also outlined. Chapters 5 and 6 analyse and present the findings of the two phases of the empirical work in this thesis: semi-structured interviews and a questionnaire survey respectively. These methods are used to collect the primary data analysed in this thesis. Chapter 7 concludes the thesis and discusses the major findings from the empirical work. It provides a review of the evidence regarding the capital investment appraisal process in Libyan firms – and perceptions regarding it – as well as pointing out the specific contributions of the thesis to knowledge in the area. Finally, the chapter outlines the limitations to the work, and suggests some ideas for future related research.

1.5 Conclusion

This chapter has supplied an overview of the whole thesis and outlined the research questions that will be investigated. Such an overview should provide a

“road-map” that will guide those who read this thesis. As such, it is hoped that the road-map will indicate the direction of travel throughout the thesis and avoid any confusion which may arise about how the different chapters fit together as well as about the links from one chapter to the next.

Chapter Two

Literature Review

2.1 Introduction

The investment appraisal process in general, and the use of investment appraisal techniques in particular, have been the subject of extensive academic investigation for more than forty years. Most of the studies in this investigation have been undertaken in developed countries, especially the UK and the USA and have involved a longitudinal series of studies to determine whether the evidence about investment appraisal practice has changed over time. In contrast, very few published studies have been conducted on the investment appraisal process and the usage of different capital budgeting techniques in developing countries, especially those in Africa.

The purpose of this chapter is to present a detailed analysis of the literature on investment appraisal and related issues by reviewing the most important previous studies in the area. The chapter is structured into ten sections; the next investigates the investment appraisal process as a whole before going on to discuss the usage of specific appraisal techniques in more detail in Section 2.3. Section 2.4 focuses on the issue of capital rationing as a constraint on investment decision-making. Sections 2.5 and 2.6 review the issue of advance manufacturing technology projects and real option theory respectively, and their important impact on investment decision-making. Section 2.7 provides a summary of those studies which examine the role of risk in the investment decision-making process, while 2.8 discusses the issue of Islamic finance and its potential as a source of funding for capital investment projects. Section 2.9 reviews the small number of previous studies that have been conducted in African countries; the findings in this section should provide a useful backdrop against which the results of the current thesis can be evaluated. Finally, Section 2.10 concludes the chapter and summarises the prior findings.

2.2 The Capital Investment Process

The importance of the capital investment process derives especially from its direct link to shareholder wealth creation; the success of the process depends on the existence of a well-developed and achievable strategic plan (Arnold, 2008; McIntyre and Coulthurst, 1985). There are two essential conditions that generate the need for making capital investment decisions: the presence of firm objectives and the existence of alternative capital expenditures that can help achieve the aims of the company. The absence of corporate objectives obviates the need for making investment decisions, while a lack of alternatives would eliminate the use of appraisal techniques to select the best path (Lumby and Jones, 1999).

Pike and Neale (2006) pointed out the following assumptions of the textbook version of the capital investment process: (1) the ideas for capital investments simply appear on managers' desks; (2) the alternatives are independent; (3) the net present value techniques incorporate risk completely; (4) intangibles are insignificant; and (5) estimation of the cash flows is free from bias. While in theory the capital investment process permeates the whole company, in practice it is usually a bottom-up process; by contrast, a firm's strategic plan operates on a top-down basis (Brealey and Myers, 2003). This difference can sometimes lead to conflict between the two[3].

The investment appraisal process is widely acknowledged to be much broader in practice than is suggested in textbooks. For example, a large number of employees at various levels of management are involved in the decision process which usually

[3] The strategic plan of the company is usually aimed at serving the company's goals often for the medium and long-term, based on relatively distant future expectations. In contrast, the capital investment appraisal process mostly reflects detailed current needs and requirements for achieving the goals of the company in the short and the medium-term. These differences in the level of details and time-span may cause conflict between the capital investment appraisal process in the short- and medium-term and the firm's long-term strategic plan.

consists of a number of stages and tasks (King, 1975; Pinches, 1982; Pike and Neale, 2006; Arnold, 2008). While these stages and tasks may happen in sequence, this is not always the case as each capital investment is relatively unique and some of these stages may not be necessary (Pinches, 1982).

The number of distinct stages varies a cross studies, but the best known includes six stages -following model of King (1975). According to King (1975), each project starts with some trigger or event where a need is identified; Pinches (1982) labelled this stage the "identification phase". Once an opportunity has been identified, King (1975) suggested that it needed to be screened in order to determine if an investigation was warranted. If a project passes this hurdle, King (1975) suggested that a detailed analysis was needed and different alternatives evaluated.

Table 2.1 Stages in the Capital Investment Decision-Making Process

	King (1975)	**Pinches (1982)**	**McIntyre and Coulthurst (1985)**
1	**Triggering:** (recognition of opportunity).	**Identification:** (of the needs of the firm in response to opportunities and/or problems).	**Creation**: (divided into: (a) Search for ideas, (b) Identification of Sources of ideas and (c) Screening of ideas).
2	**Screening:** (is it worth investigating?).	**Development:** (of various project types based on stage one).	**Decision:** (divided into: (a)Classification of proposals (b)Proposal feasibility clearance and (c) Proposal evaluation).
3	**Definition:**(analysis and generation of feasible alternatives).	**Selection or choosing:**(of one or more projects).	**Implementation:** (divided into: (a)operational framework (b) budget control and (c) Post-audit).
4	**Evaluation:** (alternatives).	**Control, or post completion evaluation.**	
5	**Transmission:**(through the organisation).		
6	**Decision.**		

Note: The table shows three different points of view the characterisation of the stages of the capital investment decision-making process. Source: King (1975), Pinches (1982) and McIntyre and Coulthurst (1985).

Pinches (1982) termed this the "development" and "selection" phases of the process. McIntyre and Coulthurst (1985) combined both stages into one, which they labelled "decision". After a decision is taken about proceeding with a project, Mcintyre and Coulthurst (1985) suggested that the process moved to an "implementation" stage where news about the decision is transmitted throughout the organisation (King, 1975). Pinches (1982) argued that "control" over the project and post audit evaluation was necessary to ensure that the investment proceeds as predicted in the capital budgeting process.

While the number of stages differs in each of the three models which have been proposed in the literature, a similar range of tasks is always present. The three models therefore differ in the level of disaggregation provided and the degree of emphasis given to specific parts of the process. Irrespective of the different number of stages highlighted in all descriptions, the central message is the same. King (1975), Pinches (1982) and Mcintyre and Coulthurst (1985) point out that, whereas the use of capital budgeting techniques in the decision or selection stage of the models is only one task in the investment appraisal process, it represents the entire focus of textbooks in the area (e.g. Arnold, 2008; Pike and Neale, 2006). However, a number of more recent textbooks have attempted to acknowledge the broader process underpinning a firm's investment appraisal decisions. For example, Pike and Neale (2006) as well as Arnold (2008) now provide diagrams that illustrate the multi-stage nature of investment decision-making in firms (See Figure 2.1).

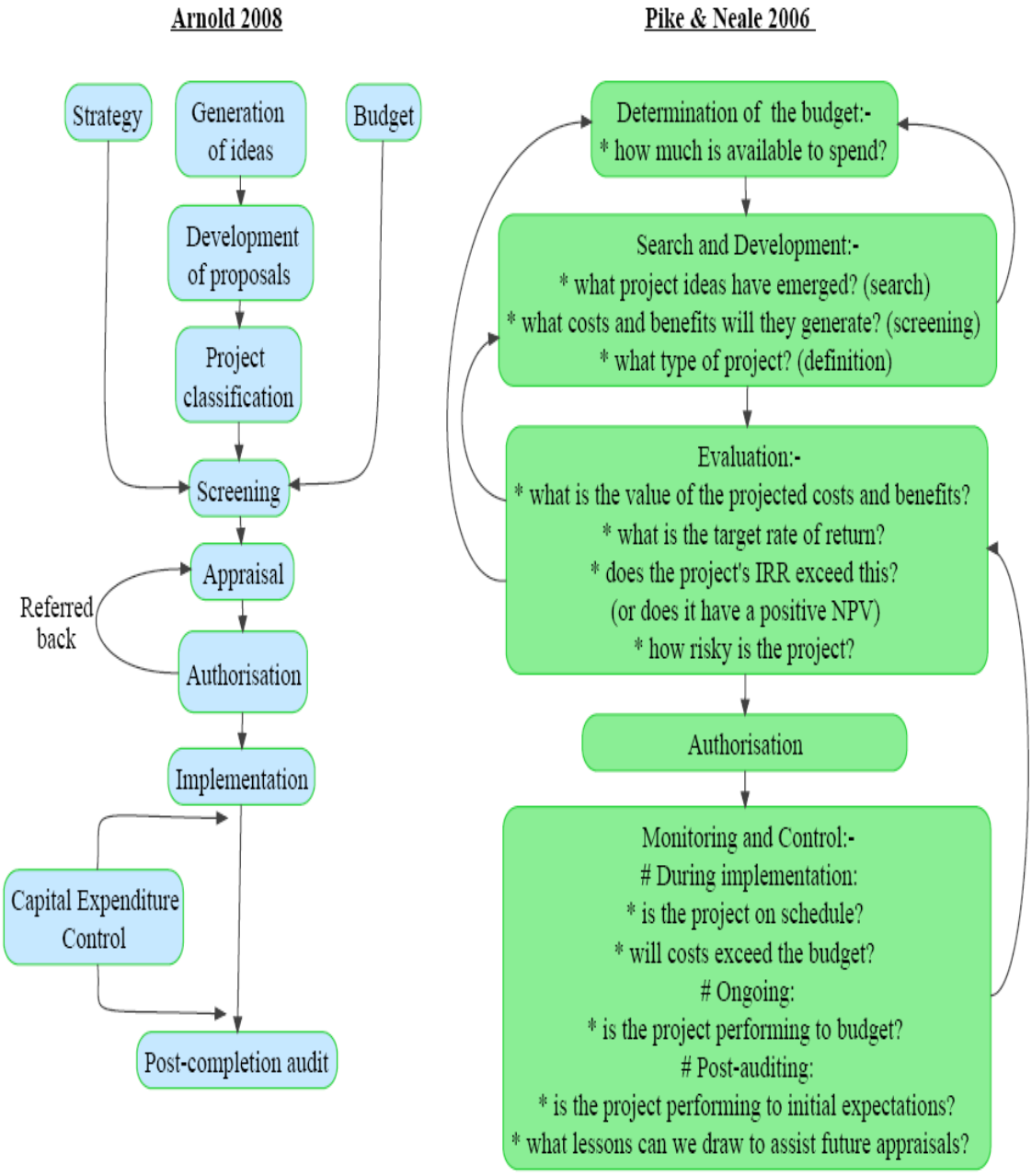
Figure 2.1 illustrates the similarity of the capital investment process as described throughout the literature in this area; the tasks identified as well as the different number of stages into which these tasks are grouped are not dissimilar. For example, Pike and Neale (2006) split out these tasks into five main stages and outline a

comprehensive model of the process, which details the steps that a company goes through when investing in a capital project.

According to Pike and Neale, the firm must initially determine how much funds are available to finance potential future projects. In theory, the firm should be able to finance all investment via access to the capital market although, in practice, this option is usually limited because of (i) internal limits which have been set by the firm or; (ii) external constraints imposed by outside bodies, for instance, the capital markets (Zhang, 1997).

Once a budget has been set, Pike and Neale suggest that firms enter a Search and Development phase in the investment process. Four tasks comprise this stage. First, a firm has to search for investment ideas that, theoretically, evolve from the interaction between available finance and investment opportunities. However, in reality, searching for investment ideas involves extensive effort, time and risk. Second, these ideas must go through a preliminary screening process, where the costs and benefits of potential projects are assessed in order to filter the ideas, to those which are worthy of further evaluation. Third, a detailed description of a project's economic and technical characteristics most be produced; in addition, alternatives and their consequences must be assessed. Lastly, projects must be classified into categories; for example, new-product projects, replacement projects and strategic investments.

Figure 2.1 The Capital Investment Process.



After ideas have been developed, Pike and Neale argue that an evaluation is necessary. Evaluation involves comparing project costs and benefits in more detail as well as assessing risk in a more formal manner; for instance, identifying the required rate of return and comparing it with the internal rate of return. Once this is completed, authorisation is necessary. In this next stage, the chosen project passes through various organisational levels within the firm until it receives final approval or rejection. Finally, if a project is approved, it must be monitored and controlled in subsequent periods. This fifth and final stage relates to both pre- and post-decision controls. The pre-decision control, in fact, applies at all previous stages; for example, determination of the capital investment budget, the setting of a required rate of return and strategic goals. Post-decision control involves monitoring and post-audit procedures; the later stage is considered as critical by Pike and Neale (2006). It is the last stage in the capital investment process and is intended to: (i) build up experience and encourage the use of reliable and realistic techniques to appraise potential projects in the future; and (ii) maintain the monitoring and financial control of current projects (Arnold, 2008; Pike and Neale, 2006). Arnold (2008) describes this stage as follows:

> *"Post-completion auditing is the monitoring and evaluation of the progress of a capital investment project through a comparison of the actual cash flows and other costs and benefits with those forecasted at the time of authorisation. Companies need a follow-up procedure which examines the performance of projects over a long timespan, stretching over many years. It is necessary to isolate and explain deviations from estimated values."*(p.143).

This definition highlights the main difference between a regular follow-up and the concept of post-completion audit; the latter involves a formal comparison of the

observed performance with the expected performance of the project, in order to foster a learning environment where staff benefit from prior experience with investment, which feeds into future capital budgeting decisions. Brealey and Myers (2003) note that this stage is now considered critical by most firms.

What all authors in this area agree on is that the capital budgeting process consists of many phases. While there is some disagreement over the number of phases that exist and what these phases are, this disagreement is relatively minor because the lists produced actually identify similar functions. By contrast, the substantive literature tends to focus mainly on the evaluation stage or on the usage of different appraisal techniques. Several authors have suggested that there are other important phases, which should be given more attention in the substantive literature such as the source of ideas, how much is available to spend on those ideas, the monitoring and control of expenditure during the implementation stage, on-going monitoring of the project and post-auditing of the investment. An early study in this area demonstrated that more than half of the medium-sized companies in their sample frequently did not conduct any post audit of capital expenditure (McIntyre and Coulthurst, 1985)[4].

[4] However, US enterprises saw the importance of the post-audit process much earlier than their UK counterparts (Pike and Neale, 2006); only 48 per cent of large UK firms conducted formal post-audits of investments in 1985 (Neale and Holmes, 1988) compared to 79 per cent of US companies (Neale, 1995). Nevertheless, by 1997, this UK percentage had increased to 100 per cent in this more recent investigation lowered this post-audit adoption rate among British companies to 88 per cent (Arnold and Hatzopoulos, 2000); however, this figure was still higher than the rate for US owned subsidiaries located in the UK (Neale and Buckley, 1992).

2.3 Appraisal Techniques

2.3.1 The Basic Capital Investment Appraisal Techniques

The main methods of investment appraisal are conventionally divided into two groups dependent on whether or not they take account of the time value of money. One group contains the discounted cash-flow (DCF) techniques: net present value (NPV), internal rate of return (IRR) and the profitability index (PI). The other group comprises the non-DCF based techniques (non-DCF), and includes the payback period (PB) and the accounting rate of return (ARR).

Recognition of the time value of money is the main characteristic of the DCF group of investment appraisal methods. The methods that employ the time value of money principle are NPV, IRR and PI. Under the NPV method, future cash flows are discounted by the opportunity cost of capital (the cash inflows of the best alternative use of this amount of money, which will be foregone) and then compared with the present value of the investment outlay. If the resulting NPV is positive, the proposed project is acceptable, but if the NPV is negative, then the proposed project is unacceptable or rejected[5].

The IRR (or yield on a project) is the rate of discount that, if applied to the cash inflows of a project, produces a zero NPV (Pike and Neale, 2006). If the cost of the capital is less than (exceeds) the IRR then the project should be accepted (rejected).

The third DCF technique, PI explicitly recognises the need to examine the efficiency of each unit of capital invested in the project. The profitability index is the ratio of the present value of project's inflows to the present value of the initial outlay

[5] NPV is considered theoretically ideal, as the project generated corresponds exactly with the incremental change in shareholder wealth resulting from undertaking the project.

(Pike and Neale, 2006). In this case, the decision rule accepts a project if its PI is more than 1. However, the technique's main strength is in providing a basis for project ranking that maximises the return per unit of capital.

The most commonly employed non DCF-based techniques are the PB and the ARR or return on capital employed (ROCE)[6]. A project's PB is the time taken for the inflows to repay the initial outlay. With this technique, the decision making rule is very simple; the best project is the one which has the shortest PB (Pike and Neale, 2006); with all acceotible projects having paybacks shorter than an arbitrary target considered acceptable. The ARR or ROCE or return on investment (ROI) compares the average profit of the proposed project with the capital invested (Arnold, 2008). In practice, it is calculated either on the basis of initial capital invested or average capital invested (Pike and Neale, 2006). The decision rule indicates that the project with the highest ARR should be accepted as long as it is greater than a hurdle rate set by the firm[7].

The main advantage of the NPV technique is that, like all DCF methods, it incorporates the time-value of money principle into its calculation. However, NPV is theoretically superior to other DCF-based methods (Ross et al., 2005), partly because the technique assumes that cash inflows during a project's life can be reinvested at the underlying opportunity cost of capital, (i.e. reflecting the alternative usage of the finances in question). In addition, it is directly related to the wealth of shareholders; under (admittedly somewhat restrictive) assumptions the wealth of shareholders is

[6] As detailed later, many decision-makers appear to prefer to use non-DCF techniques despite the fact that these do not take account of the time value of money (Ross et al, 2005) while others employ both non-discounting and discounting techniques in order to control for the effect of uncertainty (Ross et al, 2005; Brigham and Ehrhardt, 2011).

[7]All these techniques have practical and/or theoretical drawbacks. Therefore, the situation in which a particular technique should be used, or even how many techniques should be applied to give the best result is a complex issue. Detailed figure about these issues is contained in Appendix A.

maximised if the management accepts all projects that have positive NPVs (Fisher, 1930; Hirshleifer, 1958; Lumby and Jones, 1999; Brealey and Myers, 2003; Arnold, 2008). According to the rule, managers should accept all investments up to the point when the return on the investment equals the discount rate (i.e. the cost of capital)[8]. NPV, therefore, provides theoretically optimal solutions in the face of mutually exclusive projects, variable discount rates and unconventional cash flows (Arnold, 2008).

The main disadvantage of the NPV technique relates to its unrealistic assumptions; the efficiency of capital markets, the accurate measurement of all risk, and the existence of only one market interest rate (Lumby and Jones, 1999). In addition, it has been argued that the technique is difficult to understand and communicate to non-specialists, with a rate of return figure being preferred to an absolute figure (Lumby and Jones, 1999; Brealey and Myers, 2003; Arnold, 2008).

This limitation of the NPV appraisal techniques is one of the main advantages of the IRR method; it is a percentage rate of return on projects which most managers find easy to comprehend. In addition, it is based on DCF and takes account of the time value of money (Jones and Dugdale, 1994; Pike and Neale, 2006). The main disadvantage of IRR is that it assumes that cash flow received during the project's life can be reinvested at the IRR; if the IRR is greater than the cost of capital, then this assumption will lead to an exaggeration of the project's return (Lumby and Jones, 1999; Arnold, 2008)[9]. The other disadvantages of the IRR method is the fact that it ignores the scale of projects; it does not give a ranking consistent with NPV

[8] Such an idea allows for the separation of the investment (firm) decision from the consumption (investor) decision (Lumby and Jones, 1999; Brealey and Myers, 2003).

[9] however, this serious problem can be avoided by use of the modified IRR (MIRR), which assumes that all cash flows are reinvested at the cost of capital until the project's termination. This adjustment ensures IRR's consistency with NPV and therefore, aids managers who prefer to use IRR.

(and therefore, the maximisation of shareholder wealth) in the case of mutually exclusive projects; the IRRs of different projects are not additive; it cannot be applied easily in the face of a variable discount rate; and unconventional cash flows give rise to multiple solutions (Lumby and Jones, 1999; Pike and Neale, 2006; Arnold, 2008).

Although the payback technique does provide a crude (in terms of classical finance logic) measure of investment profitability, it can act as a useful screening device to complement other techniques. In addition, the method is particularly useful at times when liquidity is constrained and firms require rapid cash inflows. In the case of projects with lives at least twice the payback period, the latter provides a good approximation of the IRR since the reciprocal of the period is close to the IRR (Arnold, 2008). There are two obvious theoretical problems with the payback method. First, it ignores the time value of money concept (although it can be adjusted by discounting the cash inflows prior to calculating the period). Second, cash flows after the payback period are ignored, which is a particular problem if the cut-off point is chosen arbitrarily (Arnold, 2008).

One of the most attractive features of the ARR method is that it is based on accounting profitability, and is relatively easy to understand and communicate to non-financial specialists (Arnold, 2008). Moreover, the ARR provides a direct link between accounting and financial data and, like the IRR, can be used as a complement to more sophisticated techniques. In addition, ARR is purported to be a good secondary criterion to underline the probable impact of an investment on a company's profitability; it is the figure on which divisional managers are often judged upon (Pike and Neale, 2006). The main problems with the ARR technique are that: (i) it takes no account of the time value of money; (ii) it is based on profits

rather than cash flows; (iii) it ignores the size and life-span of an investment; and (iv) it can be calculated in many different ways (Pike and Neale, 2006; Arnold, 2008).

2.3.2 The Use of Investment Appraisal Techniques in Developed Countries

Numerous studies about the adoption of alternative investment appraisal techniques now exist; the discussion here attempts to focus on the key trends, differences and underlying conclusions that can be drawn from an inspection of the literature. Whilst the studies have often been used to suggest that a theory-practice gap exists (the "flaws" in the payback method despite its usage in practice), a key point to note is that the use of sophisticated appraisal techniques (such as DCF-based methods) has become more extensive in recent years (Pike and Neale, 2006; Arnold, 2008). Relatedly, whilst the literature now stretches back many years, it is only in recent decades that issues such as cash flow forecasting, inflation and tax credits associated with investments have been given prominence (Pinches, 1982). Furthermore, many US studies between 1955 and 1975 illustrated that the use of discounted cash flow techniques increased significantly from 9% to 66% among firms. Indeed, most companies now use DCF techniques - albeit usually in addition to other less "theoretically sound" methods such as Payback (Klammer and Walker, 1984). There has been a similar increase in the use of sophisticated analytical techniques within firms' capital budgeting systems (see e.g. Pike (1988), who examined the usage of sophisticated techniques and control procedures for capital expenditure by UK firms during the period from 1975 to 1986).

More recently, a study by Sangster (1993) examined the usage of capital investment techniques among Scottish firms, explicitly comparing the results from

his survey of the 500 largest Scottish companies with the findings of earlier UK studies. Sangster discovered that the usage of sophisticated techniques was greater than the adoption of the relatively simplistic evaluation approaches (such as the ARR). Importantly, as in previous studies, this study found that most firms are used more than one technique.

A more detailed comparison of Sangster`s findings with the results of earlier studies confirms the impression from more recent studies in the area: (i) ARR is used less than before; (ii) DCF techniques are becoming more popular; (iii) NPV is increasing in popularity at a faster rate than IRR; (iv) payback, notwithstanding the above, remains the most used of the four techniques; (v) individual companies use more techniques than before; (vi) the use of DCF has increased in smaller companies as well as in their larger-sized counterparts (Mills and Herbert, 1987); and (vii) the inverse relationship between company size and use of ARR was not found in Sangster's study.

Pike's study of intertemporal (1996) demonstrated that during the years from 1975 to 1992, changes in the usage of risk analysis techniques were fairly dramatic, and that the use of NPV and post-completion audits had also risen. Pike suggested that the latter may have reflected companies' awareness of the need to assess the possibility of a project failing and the importance of formally assessing the quality of the evaluation process. The use of DCF grew markedly over the period covered by Pike's review, although it was still associated with company size; by contrast payback and ARR usage had declined (Pike, 1996). An updated version of this study by Pike and Neale (2006) arrived at the same broad conclusion that the usage of DCF techniques had increased during the period from 1975 to 1997. In terms of individual investment appraisal techniques, the usage of IRR and NPV were 84 per cent and 97

per cent, respectively, but employment of PB had fallen from its peak of 94 per cent in 1992 to just 66 per cent in 1997. The usage of ARR had dropped during the same period to 55 per cent from its level in 1997 (Pike and Neale, 2006). A similar result was documented by Graham and Harvey (2001), who found that about three-quarters of their sample used IRR and NPV followed by PB which was used by about 56 per cent of firms.

In terms of possible reasons for the increased use of the sophisticated techniques, Klammer and Walker (1984) put forward a number of suggestions. For example, they pointed out that managers have been educated in how to use these techniques. In addition, they noted that companies have become more aware of the uncertain environment in which they operate. By contrast, Pike (1988) and Sangster (1993) suggested that the main reason why the techniques have become more widely used is because of the increased use of information technology, including tailored financial application packages as well as increases in management education. Using regression analysis, Pike (1988) illustrated that the use of sophisticated techniques (such as DCF analysis and post-audits) was strongly linked with an advanced level of capital investment efficiency. Moreover, the employment of such techniques was associated with a greater perceived effectiveness in selecting and controlling capital projects. Whatever the cause, it is obvious that there has been a rise in the usage of the more advanced methods of assessing proposed investment projects (Pike, 1988).

Before moving to examine the literature in developing countries, it is worth noting that there are now a few studies of techniques' usage outside of the UK and the US. First, a study of 10 firms from the UK and the Netherlands by Akalu (2003) showed that all the UK firms applied a combination of approaches including DCF techniques and managerial methods such as economic value added (EVA) and shareholder value

analysis (SVA)[10]. While the Netherlands-based firms also used DCF techniques, the firms also applied specific additional quantitative methods when appraising information communication technology (ICT) as well as research and development (R&D) projects (Akalu, 2003). Another study by Brounen et al. (2004) included a survey of chief financial officers at 313 firms from four European countries: France, Germany, the Netherlands and the UK. This study showed that PB was the most popular technique followed by IRR and NPV, respectively. In another European investigation, Sandahl et al. (2003) documented that Swedish firms mainly employed PB, IRR and NPV, respectively. In addition, a survey by Kester and Chong (1998) covering 54 firms in Singapore revealed that CEOs in these firms considered DCF and non-DCF techniques and both were used extensively. Finally, a study of small businesses in Cyprus by Lazaridis (2004) surveyed 56 firms and reported that nearly a fifth of the companies did not use any of the main techniques, with about 57.5 per cent using payback but not NPV (Lazaridis, 2004).

2.3.3 The Theory-Practice Gap

The issue of a gap between the theory and practice of investment decision-making has been contentious – like many disputed subjects within the field of finance. While many studies have argued that any gap which may be present is trivial, they also suggest that the issue is so fundamental as to invalidate most 'textbook' expositions

[10] EVA: Assessing economic value added (EVA) performance by comparing earnings to capital investment. EVA is a method of evaluating financial performance by calculating the amount by which the earnings of a project, an operation, or a business exceeded or fell short of the total quantity of capital that was originally invested. SVA: In Shareholder value analysis (SVA), the company's value is calculated based on returns given to shareholders. It assumes that the objective of a corporation management is to maximise the wealth of the firm's shareholders. SVA is based on the premise that discounted cash flow principles can be applied to the entire corporation. SVA can be used to evaluate the contribution of a business unit or to appraise different capital investment projects (QFINANCE, 2011).

of the investment appraisal process. One of the earliest studies in the area, by Jones and Dugdale (1994), reported the results of interviews with five accountants from both academia and practice whom the researchers believed to have contrasting views about investment appraisal techniques; based on the discussion the authors did indeed conclude that a sizeable gap existed between academic theories and day-to-day practice. The evidence in the study suggested that academics tended to blame practitioners for the non-adoption of the appraisal techniques recommended in the literature. However, the study illustrates that academics and practitioners viewed the context of decision-making differently. While practitioners emphasised the multi-faceted nature of human beliefs, identifying technical, personal, social, and political factors as all being relevant (and referring to the "spurious accuracy" of NPV), academics concentrated on "Objective Rationality" in their identification of general best practice and claimed to be out to "destroy Payback". Jones and Dugdale suggested that there are two main problems faced by academics; the first relates to the difficulty in incorporating textbook theories into a practical setting, while the second involves academics being overly influenced by their academic peers, and even the position of their own department within universities (Jones and Dugdale, 1994). As a result, the authors suggested that there was a lack of engagement between academics and practitioners in this area.

In contrast, some authors have argued that the gap between theory and practice has narrowed to the extent that it has become trivial. For example, Pike (1996)[11] found an overall increase in the popularity of sophisticated investment appraisal techniques, with large companies in particular depending increasingly on "textbook" techniques such as NPV and IRR. More generally, Pike suggested that there were

[11] In this study, the author reanalysed several questionnaires sent in 1975 and 1992 to the largest 100 UK firms.

three factors which needed to be taken into account in order to fully understand this change in firm behaviour (and its implementation). The first of these factors was technology; usage of computer software during the 1980s improved and this had a significant impact on capital budgeting as DCF appraisal calculations along with sensitivity analysis became common and easier to perform. The second factor was education; the increased usage of computers allowed practitioners to produce investment performance indicators but, Pike argued, without fully understanding them; this leads to the question of whether business education needs to be improved? Furthermore, Pike suggested that more attention still needed to be paid to investment decision-making as part of a firm's larger strategic context. The third factor was the economy; inflation, capital rationing and economic uncertainty all impact on the usage of particular investment decision-making techniques and this macro-level context played an important role in the adoption of NPV and IRR.

A more recent study by Arnold and Hatzopoulos (2000) reported that three-quarters of the companies in their sample[12] applied sophisticated techniques which incorporated the effects of inflation into their analyses. Over the last two decades, this type of development has significantly narrowed the theory-practice gap. Importantly, Arnold and Hatzopoulos highlighted that UK companies are increasingly employing the financial techniques recommended by academics; for example, a majority of companies in their survey employed DCF analysis, formal risk appraisal, inflation adjustments and ex-post audits. However, most firms continued to use informal or simpler techniques alongside their more sophisticated counterparts.

[12] Arnold and Hatzopoulos surveyed 300 UK companies from the Times 1000 firms during 1997. The sample comprised 100 "large" size firms, with capital employed of £1.3-£24bn; 100 " medium" size firms with capital employed of between £207-£400m and 100 "small" firms with capital employed of between £40-£60m. The response rate for the study was 32.4%.

Arnold and Hatzopoulos (2000) also suggested that where the techniques are not adopted it is often because managers are not prepared to make precise estimations of outcomes in order to avoid future censure if their estimates are wrong, particularly when managers are able to use fewer formal methods that are familiar to them. In this context, Harris (2000) contended that managers are often not comfortable with the more sophisticated tools because they tend to believe that the approaches are overly-academic, and do not reflect managers' focus on the downside of risk (March and Shapira, 1988).

In recent fifteen years, the focus has moved to the problem of how appraisal techniques are used, rather than the simple extent to which they are employed by companies (Harris, 2000). Harris undertook a case study in 1999 of a major organisation in the logistics sector using an action research methodology. Two groups of divisional management team members were studied, with the results illustrating that decision-making in practice is heavily influenced by non-financial considerations (Harris, 2000). These non-financial factors reflected the firm's investment strategy and/or competitive behaviour. In summary, Harris (2000) argued that many studies based on behavioural sciences (and adapting a strategic viewpoint) are descriptive of modern practice and illustrate that managers employ analytical techniques which are quick and easy to comprehend.

2.4 Capital Rationing

Capital rationing can be defined as restrictions on the availability of funding for all projects with positive NPVs at the current cost of capital (Zhang, 1997). Pike and Neale (2006) defined capital rationing in a similar fashion as follows:

> *“ The process of allocating capital to projects where there is insufficient capital to fund all value-creating proposals”* (p.134)

Soft capital rationing generally refers to internally-imposed constraints, while hard capital rationing normally implies externally determined limits on investment. Hard rationing is usually a result of an unwillingness by the capital market to lend the funds demanded by companies at a given cost of capital (Mukherjee et al., 2000; Chen, 2011).

The causes and effects of external capital rationing have been the subject of many academic investigations. For example, Catt (1965) suggested an amended version of a Keynesian model, pointing out that lenders will make more money available to lend when the value of money increases. To do that, they must accept unattractive investments with higher risk and/or with lower return than they would usually require. In the original version of the Keynesian model, an increasing level of investment will result from a falling interest rate (Catt, 1965).

Externally imposed capital rationing derives from the relationship between borrowers and lenders; this relationship reflects lenders' attempts to format loan conditions to meet two main aims; to encourage borrowers to act in the interest of the lenders and to attract low-risk borrowers. Thus, financial theory provides the basis for the second proposed explanation of external rationing. Increasing the interest rate to clear the market may have practical limits; indeed, the lenders expected return might rise by less than the increase in the rate of interest because of adverse selection. At the highest rates of interest, low risk borrowers may withdraw from the market leaving only high-risk borrowers demanding funds (Stiglitz and Weiss, 1981).

By increasing the interest rate, the expected return to lenders will increase rapidly but then start to rise more slowly as it approaches a particular interest rate. After that point, the return will fall, which will cause the profits of the lenders to decline as default risk increases when the interest rate is raised beyond some upper level. Thus, rates get "stuck" below market clearing levels and expected rationing occurs again (Stiglitz and Weiss, 1981).

In contrast, soft capital rationing is usually associated with internal limits on financing which are often applied voluntarily by companies (Ross, 1985). It generally depends on a firm's situation and strategy in terms of future growth targets, although it can also represent a method of dealing with funding constraints set externally. Zhang (1997) argued that its main role is to further management control, especially in cases where information asymmetry is pronounced; for example, in large companies with multiple business lines where the head office may not have the time or ability to monitor investments in detail (Zhang, 1997). Alternatively, the firm may have set a debt limit based on past experience, and established investment ceilings for divisions to choose the best project that they have from their available opportunity set. In general, small firms, low profitability firms and high-risk firms are more likely to face capital rationing (Pike, 1983).

In terms of empirical evidence about capital rationing in practice, Zhang (1997) compared three capital-budgeting rules (NPV, Capital Rationing and High Hurdle Rates) and concluded that the usage of any of these rules directly affected the activities of management; whenever the methods were more restrictive, they resulted in less shirking by management and a more optimal policy from the point of view of shareholders. Thus, the cost of obtaining additional funds acted as a mechanism for

limiting management's motives to undertake new investments that furthered executives' goals rather than the aims of shareholders.

Ross (1986) carried out a study which examined 400 projects undertaken by 12 large US firms[13]. In interviews with 12 executives at large US firms, Ross found that decision-making about investment depended to a large extent on project size. Table 2.2 shows that for the smallest projects, the managers of a plant could decide on whether or not to proceed. However, for the largest projects (involving expenditure of more than $10m), board approval was required:

Table 2.2: Project Size and Decision-Making Authority

Project Size	Typical Boundaries	Primary Site for Investment Decision
Very small	Up to $100,000	Plant
Small	$100,000 to $1 million	Division
Medium	$1 million to $10 million	Corporate investment committee
Large	Over $10 million	CEO & board

Note: source (Ross 1986)

Ross also found that there were two types of firms as regards the allocation of investment capital. The first group of firms had a flexible budgeting procedure based on a "realistic" required rate of return. The second group of firms had two required rates of return; a higher one for small- and medium-sized projects and the lower figure for large-sized projects. However, in contrast to the first group, this type of firm practiced capital rationing at lower levels of decision-making with projects effectively competing for a fixed pool of funds. In addition, most restrictions on project funding, particularly for small projects, resulted from a shadow cost of capital that was much higher than the average capital cost (Ross, 1986).

[13] The firms were from three industries: Steel, Paper and Aluminium The projects were classed into three groups: 300 "small" , 100 "medium " and 12 "large". However, the large groups are probably not entirely representative of such projects because of a lack of information provided by firms regarding these.

Trivoli and McDaniel (1987) analysed aggregate capital expenditure data, collected between 1961 and 1975, and used variations in adjusted gross national product (GNP) to calculate a measure of uncertainty. On the basis of three tests (a two variable regression, discriminant analysis and multiple linear regression), the authors reported that most of what might appear to be capital rationing actually reflected a rational process of decision-making under uncertainty. More specifically, medium- and small-sized companies suffered from capital rationing as a result of limitations set by lenders. However, in difficult credit times even large companies suffered from significant limits on investment. According to Trivoli and McDaniel (1987), in the course of credit crises, many large corporations reduce their capital budgets. The reductions are for a number of reasons: (i) scarcity of acceptable investment during crises times; (ii) increases in the cost of all sorts of capital; and (iii) an increase in uncertainty about the future (Trivoli and McDaniel, 1987).

Two of the most widely cited studies about capital rationing are the investigations of Pike (1983) and Mukherjee and Hingorani (1999) for the UK and US. Both studies supported the idea that capital rationing is, in general, internally imposed. Each study explicitly linked capital rationing to: (i) a lack of demand for funds; and/or: (ii) a lack of "attractive" projects; and/or: (iii) the existence of internal ceilings on the availability of funds.

Pike`s (1983) study focussed on the views of financial directors and controllers for the 208 largest industrial firms in the UK[14]. He documented an inverse relationship between borrowing limits and both firm size and profitability. In addition, there was evidence of a negative relationship between the risk exposure of the firm involved and the level of external capital rationing imposed.

[14] The sample represented an 83.7 per cent response rate to the questionnaire distributed.

Mukherjee and Hingorani's (1999) survey targeted directors in Fortune 500 firms. The authors sent questionnaires to 500 chief financial officers and received 102 usable responses. The study pointed out some reasons as to why capital rationing might exist. In particular, rationing was thought to help firms avoid accepting risky projects (and costly external funding) and/or to counteract middle management's tendency for over-optimism. In general, the respondents disagreed with the view that capital rationing should not exist in an efficient market. Indeed, 83% of firms that had experienced limits on their funding disagreed with the idea that capital rationing conflicted with the firm's goal of maximising shareholder wealth; these respondents saw it as a means of ensuring that the most profitable projects were undertaken (Mukherjee and Hingorani, 1999).

Mukherjee et al. (2000) built upon the results of Mukherjee and Hingorani (1999) by concentrating on two scenarios that emerged from their previous study. Specifically, the two main reasons put forward for capital rationing (the biased forecasts of management and the costly external funds arguments) were examined. The study concluded that an unwillingness to raise external funds was the main reason why capital rationing existed, although firms tried to counteract any bias in managerial forecasts by raising the hurdle rate required from a project (Mukherjee et al., 2000).

2.5 Advanced Manufacturing Technology (AMT)

The term "AMT" refers to computer-aided technologies in the design, manufacturing, transportation and testing phases of production. Generally, AMT is categorised into two principal groups: (1) the classical continuum of basic

manufacturing processes which extends from make-to-order manufacturing to continuous manufacturing; and (ii) the level of integration of the overall manufacturing system (Hill, 1989).[15]

Throughout the 1980s, there was a growing criticism about the use of conventional financial appraisal techniques when the capital investment being considered related to AMT[16]. Specifically, it was argued that conventional financial appraisal techniques were weakening the continuing competitiveness of the UK and US's manufacturing industries because they were inhibiting the adoption of vital AMT (Lee, 1987; Samuels et al., 1990). In particular, it was feared that the problem lay in the fact that this type of investment decision is primarily strategic in nature, not "financial" in the conventional sense (Samuels et al., 1990).

An enormous number of papers have focused on investment in AMT, but they have all tended to focus on similar aspects of the topic; for this reason, rather than reporting on each individual study, three extensive reviews of this literature are summarised in the current section of the chapter along with a recent detailed empirical study of views on investment in AMT.

The first two reviews, one by Finnie and another by Swann, were both published in 1988. In these papers, which were mainly review studies of the issues in the UK and US, the authors argued in favour of conventional financial appraisal methods (e.g. PB and DCF) in the context of a broader economic approach. However, the authors emphasised, that the support of better appraisal process management, added

[15] For instance, Pike and Neale (2006) identified six of these technologies: computer-aided design (CAD), computer-integrated manufacture (CIM), computer-numerically controlled (CNC), flexible manufacturing systems (FMS), direct numerical control (DNC).

[16] See, Kaplan (1986) who famously questioned whether such investment would have to be justified by faith alone.

to other analytical tools (e.g. value analysis and non-quantitative analysis) and strategic justification (e.g. competitive advantage, image) was required.

Swann (1988) noted that, in general, new investment evaluation is traditionally based on accounting-based and finance-based methods (for example, PB, IRR, NPV and IRR). However, Swann argued that these appraisal techniques were of limited usefulness when the subject of investment was AMT; in these cases, analytical judgment should play a key role (Swann, 1988). Finnie (1988) concurred with this; he explained that the main shortcomings in the AMT decision process related to excessive risk aversion among management, particularly in the short term, which may be reflected in the miss use of traditional investment appraisal techniques (Finnie, 1988).

A more recent review by Chan et al. (2001) aimed to set out a theoretical framework for assessing investment in AMT. Central to the framework put forward by Chan et al. is the notion of whether or not AMT appraisal is founded on the experiences or judgement of decision-makers, all the features of the investment need to be quantified in numerically-accurate forms; all factors, both objective and subjective, should be included in the process. In practice, Chan et al. argued that the majority of firms employ one of two appraisal approaches (economic or analytic/ strategic) to deal with AMT investment decisions. However, the authors argued that these approaches need to be integrated in an AMT context; both need to be considered for dealing with the AMT appraisal process (Chan et al., 2001)[17].

Abdel-Kader and Dugdale (1998) used a postal questionnaire to survey the financial directors of 466 large UK firms; their response rate was 23%. The survey

[17] See Appendix A for a detailed figure of Chan et al..

asked about the extent to which seven types of AMT projects had been adopted; responses were used to categorise firms into three groups: Non AMT integrated, Less AMT integrated and Fully AMT integrated. They found that there was an increase in the use of the analytic and strategic approach for investment involving AMT but not at the expense of the economic approach. The strategic intangible benefits of AMT (reduced inventory levels, reduced lead times, greater manufacturing flexibility and greater product quality and reliability) are recognised as being the most important features for determining the success of such projects. Where respondents were asked about which approach was used by their firms for appraising investments, they found that in practice firms used the economic approach to evaluate both AMT and non-AMT projects. In addition, firms used particularly stringent financial criteria (a three year payback period and a 10 per cent required rate of return) when appraising AMT projects. Nevertheless, in practice, the firms tended to use a mixed approach (i.e. economic and strategic elements) to deal with the combination of conventional financial and intangible benefits offered by the AMT investments. In terms of risk analysis, the study found that firms did not employ sophisticated techniques for analysing AMT projects; the most used technique was sensitivity analysis in a majority of AMT and conventional investment cases. Overall, the study provided support for the use of the mixed approach (i.e. with both economic and strategic elements been considered) appraisal of AMT projects.

2.6 The Role of Real Options in the Investment Decision-Making Process

A sizeable component of the most recent literature on investment decision-making has focused on the potential use of option pricing theory in the process. The

integration of real option models into an investment decision-making framework has been suggested as an additional strategic dimension to the process in the dynamic modern business world. As well as incorporating strategic elements of an investment into the analysis, real options help to combine quantitative analysis and qualitative assessments of a capital project (Trigeorgis, 1996).

Pike and Neale (2006) defined real options as *"the options to invest in real assets such as capital projects."*(p.311). Arnold (2008) expanded on this notion when he described the difference between the real option approach and the traditional appraisal techniques as:

> *"The perspective of the real options takes account of future managerial flexibility whereas the traditional NPV framework tends to assume away such flexibility. Real options give the right, but not the obligation to take action in the future."*(p.219).

There are several real options that can be considered when undertaking a capital investment. The two most regularly discussed real options in the literature are: (i) the option to postpone (or to defer) an investment: The investor may postpone the start of the capital investment for a period of months or years (Trigeorgis, 1996; Copeland et al., 2005); and (ii) the option to abandon an investment: where the investor has the right to re-sell a capital asset if the present value of the benefits of continuing its operation are worth less than its market value (Trigeorgis, 1996; Copeland et al., 2005; Pike and Neale, 2006; Arnold, 2008).

A growing body of literature has investigated the usage of real options theory to take account of managerial flexibility in the investment decision-making process. For example, a study by Yeo and Qiu (2003) provided case study evidence of the need for the incorporation of flexibility into DCF calculations when investigating the

automobile industry. In their study, the authors described the similarity and differences between financial and real options:

> *"The real options in option thinking are based on the same principles as financial options. To have a real option means to have the possibility for a certain period to choose either for or against something, without binding oneself up-front. Real options are valuable because they incorporate flexibility and potentials. However, the fact that real options are like financial options does not mean that they are the same. The major difference between financial options (e.g. stock options) and real options is that real options are applicable to real assets. A real asset is usually something tangible, such as a factory, machinery, etc., while a financial asset typically consists of stocks, bonds, currency, etc.*" (p. 246)[18].

In an earlier study, Busby and Pitts (1997)[19] identified and discussed five general types of real options: (i) the postponement option; (ii) the abandonment option; (iii) the rescaling option; (iv) the growth option (the possibility to expand or develop an investment in the future after starting it now); and (v) the technical change option (to change the technical nature of an investment). The authors suggested that the growth

[18] Yeo and Qiu (2003) argued that there are seven different types of real options, reflecting the extent to which they provide for improved business management. These seven types consist of: (1) growth options: multiple product generations, new generation processes or products or markets; (2) staging options: when benefits and cost are uncertain, a firm should commit to investments in stages and retain the abandonment option at different stages while retaining the growth option, e.g. multi-stage investments; (3) deferment options: a postponed project allows the firm to learn more about a potential project or market and market outcomes; (4) exit options (abandonment or divestment): enable a firm to cut its losses when market conditions get worse by abandoning the project; (5) sourcing options: increasing the number of input sources for content, channels and platforms; e.g. outsourcing and subcontracting can transfer risk of internal failure or avoid committing internal sources; (6) business scope options: depending on market conditions (prices and demand) the scale and capacity of a project can be either be expanded or contracted; (7) learning options: the prototype or pilot project can give the firm a good chance to learn about production costs and customer acceptance. Yeo and Qiu (2003) emphasised that real options theory in an investment appraisal context values managerial flexibility and the probability of achieving better returns on investments. Moreover, the real options approach is likely to be especially useful in cases where there is a high level of uncertainty and volatility.

[19] They surveyed the financial directors of FTSE 100 firms during 1995 and the response rate was 44%.

and postponement options occurred the most frequently in practice[20], but all the option types were important[21]. Most of the firms surveyed did not have any form of procedure to formally assess the value of postponement, abandonment and growth options, but a large minority of the firms had informal procedures to assess the worth of these options. Several factors were noted by respondents as variables affecting the value of the options (such as the length of availability of the option, the degree of uncertainty and the interest rate). However, real option analysis at the time of the study did not incorporate organisational or behavioural factors; more generally, respondents indicated that the limitations of the usefulness of option theory were an issue; they suggested that the value of an investment depended mainly on the commitment of the workforce to make the investment a success as well as broader economic factors. In reality, rules of thumb were used to evaluate real options rather than any complex mathematical modelling. However, it should be noted that Busby and Pitts (1997) found a difference between individual decision-makers in their awareness of real options. While some were fully attuned to the benefits of the flexibility which real options were trying to capture, others believed real options could actually reduce organisational commitment to a project.

In a later study, Miller and Waller (2003)[22] summarised the strengths and weakness of the real option approach. Strengths included the facts that a real option: ”emphasises the contributions of flexibility and active management in creating value; limits downside risk by sunk investments” (p.98). In addition, they noted that “option pricing emphasises potential value, not just net present value” (p.98) and “helps

[20] 46% and 54% of respondents stated that they recognised growth and postponement, options respectively, in capital projects.

[21] A majority of respondents agreed that all five types are important.

[22] Miller and Waller’s (2003) theoretical study was based on a hypothetical firm with three business units and three real options.

managers decide when entry and exit should occur" (p.98). The weaknesses highlighted included: "many of the inputs to option valuation have no direct proxies outside a financial context; modifying models to fit a particular situation may be costly or impossible" (p.98). In addition, they noted that "managers lack experience and organizations lack the systems needed to support real option analysis" (p.98). More specifically, Miller and Waller (2003) pointed out that the real options approach was "useful for evaluating projects, but less helpful for designing them" (p.98) and "neglects portfolio implications" (p.98). Finally, they noted that "despite recognising uncertainty, real option analysis does not reveal the environment factors affecting fluctuations in resource value" (p.98).

In the same study, Miller and Waller (2003) proposed a framework that integrated real option analysis and scenario planning, with the intention of giving managers the ability to appraise environmental effects and management influences on the value of long-term investments. The approach emphasised that managers should consider real option investment opportunities simultaneously not sequentially in a broader process of combined risk management. While real option analysis is inherently quantitative in nature, Miller and Waller argued that their integrated approach privileged qualitative features because it included scenario-planning. Consequently, the approach gave managers a tool that could be used to consider the decision-making process in a broader environment than would be the case if only the classic DCF techniques were employed.

2.7 Risk and Investment Decision-Making Process

The modern business world is subject to a great deal of complexity and uncertainty; this makes prediction about the returns of virtually all future projects subject to risk (Lumby and Jones, 1999). There are a number of broad categories of risk[23] that firms should consider in the context of capital expenditure decision-making aimed to enhance shareholder value (Pike and Neale, 2006). Firs, a firm faces business risk; this type of risk occurs when the operating outcomes or the returns before interest are variable. This type of risk is influenced by the extent to which the business environment, as well as firms' operating cost structures, are volatile. Second, a firm faces financial risk; this risk results from financial gearing, with higher debt leading to greater variability in shareholder returns. Third, a firm must consider portfolio or market risk: this risk reflects the variability of returns on shareholders' portfolios, which can be reduced by appropriate diversification (Markowitz, 1952).

A broad range of methods now exist that can be used by the decision-maker to handle risk in capital investment; these are now common to most modern finance texts. Firstly, sensitivity analysis can be used to focus on the specifics of an investment. This method estimates the possible effect on the value of a project if estimates of a single parameter are incorrect. It thereby provides the decision-maker

[23] The terms "Risk" and "Uncertainty" are used interchangeably in everyday life to represent the notion that future project returns are unknown at the start of a project's life (Lumby and Jones, 1999; Arnold, 2008). However, in academic terms there is a difference:

> *"**Risk** refers to the set of unique consequences for a given decision that can be assigned probabilities, while **Uncertainty** implies that it is not fully possible to identify outcomes or to assign probabilities."* (Pike and Neale, 2006) (p.196).

Usually risk is determining by computing the standard deviation of the historical outcomes or mean returns.

with a spectrum of answers to a set of "What if" questions about a potential project (Arnold, 2008).

Secondly, scenario analysis can be employed; it focuses on the impact of variations of important variables by considering the impact of a change in some of the key variables on the NPV of an investment (Arnold, 2008). Therefore, it is argued to provide greater realism than the sensitivity approach since more than one variable is allowed to change.

The third method, simulation (e.g. Monte Carlo Analysis) is an extension of scenario analysis that emerged from the operations research literature. The technique of Monte Carlo simulation calculates the expected result of the overall possible project outcomes based on a pre-specified probability distribution (Arnold, 2008). Fourthly, break-even analysis, identifies the point at which a project starts to lose money; whilst it is often based on accounting numbers and lacks the sophistication of modern scenarios analysis, the technique remains central to modern textbook expositions of risk (e.g. Brealey and Myers, 2003). The fifth approach to handling risk is decision tree analysis; the choices required at various stages of a new capital project - and the consequences of these choices – are set out as various "branches" in a decision tree. Decision trees are now used to incorporate the real options embedded in investment projects, usually in the conventional framework (Brealey and Myers, 2003).

In addition to the above, there are simpler ways to deal with the potential risk of future projects. Many of these take the form of rules of thumb, often reflecting the personal experiences and biases of the decision-maker; the impact might be to

shorten the payback period or raise the required internal rate of return, but in a non-systematic fashion.

In practice, sensitivity analysis has increasingly become the main method used by US and UK firms to assess the impact of risk (Klammer and Walker, 1984; Pike, 1988) while other approaches such as raising the required rate of return and shortening the PB are used less frequently. In terms of cost of capital determination, the CAPM is the preferred method among firms in the US (Graham and Harvey, 2001) as well as in India (Anand, 2002; Larla, 2006) and Argentina (Pereiro, 2006). By contrast, firms in China and the Netherlands often use the WACC to determine their cost of capital (Hermes et al., 2007) while in Cyprus, the cost of debt is used to estimate the cost of capital, with statistical, scenario and sensitivity analysis employed to evaluate risk (Lazaridis, 2004). A study by Kester et al. (1999) of six Pacific countries (Australia, Hong Kong, Indonesia, Malaysia and the Philippines, Singapore), reported that the CAPM is widely used to determine the cost of capital in Australia and Hong Kong, while the cost of debt is the most frequently used measure in Indonesia and the Philippines. Regarding risk evaluation methods, scenario analysis was commonly used in all the countries in the survey except Australia (Kester et al., 1999).

Some studies have focused on practices in African and MENA countries. In particular Elamilade (2006) found that the cost of capital in Nigerian firms is generally based on the cost of debt, while in GCC countries (Chazi et al., 2010), Kuwait (Mutairi et al., 2009) and Bahrain (Al-Ajmi et al., 2011), the CAPM is usually employed to determine the cost of capital. In terms of risk evaluation, sensitivity analysis is the most common method employed among firms in GCC countries (Chazi et al., 2010), Kuwait (Mutairi et al., 2009), Jordan (Khamees, 2010)

and Bahrain (Al-Ajmi et al., 2011), while in Nigeria, the majority of companies do not appear to evaluate risk (Elamilade, 2006).

2.8 Islamic Finance

The important role played by finance of investment provided on the basis of Islamic principles is obvious to a study, such as the present one, that is situated in a Muslim nation such as Libya (Karim et al., 2005; Karim et al., 2012). Islamic finance attempts to develop principles for the regulation and use of investment capital on the basis of shariah law (Visser, 2009). Lee and Detta (2009) described the broader concept of the Islamic Economic Order (which involves the adoption of Islamic Finance) as follows:

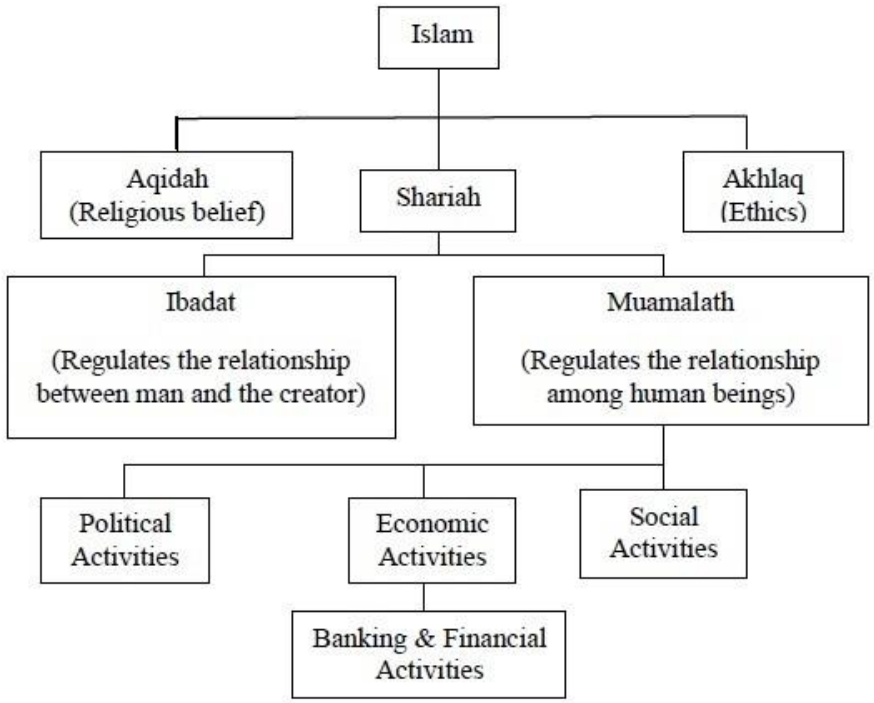
> *"The 'Islamic Economic Order' is based upon a set of principle found in the **Qur'an**. No matter what aspect of the Islamic Economic Order is introduced, for practical operations it has to base itself on the **Qur'anic** concept of social justice. The Islamic financial system, therefore, cannot be introduced merely by eliminating **riba** but only by adopting the Islamic principles of social justice and introducing laws, practices, procedures, and instruments which help in the maintenance and dispensation of justice, equity and fairness."* (p.15).

The relationship between banking / financial activities and religion within Islam suggested by Lee and Detta is illustrated in Figure 2.2 [24]. An analysis of this figure

[24] For ease of exposition, there are key terms required to learn when discussing Islamic Finance. *The Qur'an or The Quran*: the holy book of Muslims, which Muslims believe is the word of Allah "the God" revealed to the Prophet Muhammad (s.a.w). *Shariah or Sharia laws*: in Islam, shariah principles of life, including faith and practices, legal and social relations, and individual behaviours. Shariah has four main: The *Sunnah* (or *Hadith*) are the deeds and saying of the Prophet Muhammad (s.a.w) explain what the Quran and/or add new regulations and sanctions that are considered by the prophet (s.a.w) to be important where implementing the Quran instructions. The *Ijma* is the consensus of Muslim scholars about a particular issue. The Qias: It is a concept similar to analogy, i.e. a new issue can be dealt with by comparing its interests and objectives with similar notion. *Riba*, which literally

reveals that there are several types of Islamic financial products which are permitted under Shariah law; some of them are used to finance capital investment projects.

Figure 2.2: Financial activities in an Islamic context.



Note: Lee and Detta (2009)

For example, "Murabahah" consists of two transactions (purchase contract and sale contract) with a profit margin mutually agreed by both parties to the contract. Murabahah is the most popular Islamic financial product because the profit is written into the contract in advance of the transaction thereby eliminating any uncertainty associated with the financing cost (Karim et al., 2005). By contrast, "Musharakah" is a joint venture, capital sharing scheme or partnership. Musharakah contracts

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means an increase, addition or surplus. The Islamic interpretation of riba is the fixed addition to an amount of money invested for its usage, where the sum has been agreed on in advance (Visser, 2009). Moreover, Muslims' perspective on riba is illustrated by Choudhury (1986) :

> *"It is a form of excess, of unjustified appropriation of income, and it therefore is at variance with the principle tawheed (Monotheism) and brother-hood and with Islamic ideas about income distribution"* (p.11).

establish relationships between a number of partners, each of whom underwrite the capital raising and/or financing efforts. In return, the parties share any profits or losses based on the ratio of their contributions (Nomani and Rahnema, 1994).

An *"Ijarah Muntahia Bittamlik"* or (Rent to Own) contract involves a mixture of Islamic leasing periods (Ijarah) which end with the sale or purchase of the object of the contract. There are two main differences between conventional leasing and Ijarah. The first relates to object of the contract; in conventional leasing, the object is the benefit from possession of the goods, while in Ijarah, it is the benefit of either the goods and/or labour. The second difference relates to payment methods; in conventional leasing, it is generally fixed and not contingent on performance, but in Ijarah, it can be (Karim et al., 2005).

A *"Sukuk*" is an Islamic bond. It has characteristics which are similar to both shares and bonds; it gives the holder a steady stream of earnings but, of course, no predetermined interest. A Sukuk bond is backed by real assets, the ownership of which transfers to the holder with attendant benefits and risks (Schoon, 2009).

The prohibition of Riba (interest) is widely agreed on amongst Muslims, however, the time value of money concept is a source of disagreement among Muslim scholars (Ahmad and Hassan, 2007). An extensive explanation and analysis of the conflicting opinions of Muslim scholars about the issue of the time value of money concept is provided by Ahmad and Hassan (2007). For instance, some scholars argue that the prohibition of Riba (interest) does not exactly mean totally ignoring the time value of money notion (Zarqa, 1983; Kahf, 1994). On the other hand, Khan (1991) argued that the time value of money cannot be legitimate under Shariah principles; thus, Khan rejects the use of DCF techniques. On a related issue, the CAPM requires use

of a risk-free rate, which is not compliant with Shariah interest-free principles (Vogel et al., 1998; Iqbal, 2002; Hearn et al., 2008). As a result, Al-Ajmi et al. (2011) argue that the capital budgeting practices and risk evaluation of Islamic financial institutions should differ from practice in conventional institutions because of the techniques adopted, which comply with Islamic Shariah principles.

A recent study by Al-Ajmi et al. (2011) surveyed 150 Islamic and conventional financial institutions in Bahrain. It documented that there was a huge gap between the theory of Islamic financial institutions based on Shariah principles and some of the practices of those institutions; some Islamic financial institutions adopted conventional techniques which did not comply with Shariah principles. Table 2.3 illustrates Islamic financial institution's employment of conventional capital budgeting techniques.

Table 2.3 Conventional Capital Budgeting Techniques

		All Institutions %	Conventional Institutions %	Islamic Institutions %
Investment Appraisal Techniques	IRR	92	100	79
	NPV	66	78.8	46
	ARR	53	60	41
	PB	52	56	46
Discount Rate	Company Discount Rate	53	33	87
	Overseas Discount Rate	44	30	89
	Risk-Matched Discount Rate	39	47	25
	Divisional Discount Rate	27	24	33
Risk Evaluation	Sensitivity Analysis	77	69	89
	Increasing Discount Rate	59	65	48
	Adjusting Cash Flow	28	36	15
	Probability Analysis	21	18	25
	Shortening PB	12	13	10
	Beta Analysis	8	7	10

Source: Al-Ajmi et al. (2011).

The researcher believes that both the general principles and specific ideas central to Islamic Finance may play an important role in informing capital investment decision-making in a Muslim country such as Libya. The significant growth of Islamic financial institutions recently in both Muslim and non-Muslim countries (Wilson,

2007) highlights the importance of this source of capital investment funding and so an attempt is made to investigate this issue in the empirical study of the current thesis.

2.9 Investment Decision-Making in African and MENA Countries

In contrast to the vast literature in the US and the UK, very few studies have been published on investment decision-making in developing countries, particularly those in Africa, where the present study is located. However, three surveys have recently been undertaken by Toit and Pienaar (2005), Elumilade et al. (2006) and Correia and Cramer (2008). In addition to these, a numerical investigation using an analytical framework was conducted by El-Shazly (2004) and a case study published by Gilbert (2005). Table 2.4 summarises the different features of these studies. An analysis of this table reveals that although relatively few studies have been conducted about this topic for Africa, a number of countries have been considered and several research methods employed.

Not surprisingly, most studies relate to the South African experience since this country has the most developed corporate sector on the continent (Correia and Cramer, 2008). Executives in Egypt and Nigeria have been consulted, but a sizeable number of African countries, including Libya, have no research findings documented in the substantive literature. Most studies employ postal questionnaires sent to executives of listed companies (Toit and Pienaar, 2005; Elumilade et al., 2006; Correia and Cramer, 2008) and have obtained a credible response rate for their analysis. Gilbert (2005) is the main exception to this generalisation; he got wide-ranging access to two firms in the textile industry and the paper industry for his case study investigation. Khamees et al. (2010) reported that Jordanian industrial firms

Table 2.4: Previous Studies on the Usage of Investment Appraisal Techniques in African and MENA Countries.

Authors/year	Country	Study type	Sample size	Main Finding
AlObeidi (1985)	Libya	Survey Questionnaire	24 industrial firms	Only 26% of firms use objective methods (NPV, PI, ROI and PB). 15.8% use DCF methods. Firms do not assess risk objectively. Firms do not undertake post-audits.
AlWakil (2000)	Libya	Survey Questionnaire	43 firms into 4 sectors	74% of firms use PB, 35% use ARR and DCF (PI 26%, NPV 14% and IRR 5%). about 63% consider risk subjectively.
Eljelly and AbuIdris (2001)	Sudan	Survey Questionnaire	68 firms	Just under the half of commercially-oriented public sector firms do not use capital budgeting techniques while most private sector entities use these techniques. The most common techniques used in both sectors are PB, IRR and NPV respectively.
El-Shazly (2004)	Egypt	Analytical study using framework	All firms in the ESM	Using an analytical framework based on a diffusion-jump processes to model uncertainty over time shows that the value of waiting increases with uncertainty; consequently, the hurdle rates increase, with uncertainty which can be a strong constraint on the firms.
Gilbert (2005)	South Africa	Case study Interviews and documentation	2 firms	The firms do not use the traditional model of decision-making. They apply a multi-staged process to choosing a project. Qualitative factors are applied to reduce the list of alternatives. The project value is not the important factor in the process. The DCF plays a key role.
Toit and Pienaar, (2005)	South Africa	Survey Questionnaire	64 firms listed on the JSE	Firms prefer to use IRR and NPV; simpler methods such as PB are still used but as secondary methods. The methods used correlate with the size of the capital budget. The majority of firms used IRR to decide on mutually exclusive projects.
Elumilade et al. (2006)	Nigeria	Survey Questionnaire	100 firms in the NSE	Firms use one criteria or another, Private sector firms use more than one method. PB is the most common, while NPV&IRR are used as secondary methods. 65.9% of firms do not measure risk objectively. A majority of firms deal with risk by shortening the required PB and raising the required rate of return.
Chazi et al. (2010)	GCC countries	Survey Questionnaire	38 CFOs	NPV, IRR and PB are preferred (in this order) which is similar to from the US, when CAPM is used by 57.1% to estimate cost of capital.
Correia and Cramer (2008)	South Africa	Survey Questionnaire	All firms listed on JSE	DCF (e.g. NPV&IRR) are always/almost always employed by the firms. CAPM almost always used to determine the cost of capital. There is a lack in usage of relatively sophisticated techniques e.g. real options. Most firms apply scenario analysis, sensitivity analysis and break-even analysis respectively to assess risk.
Mutairi et al. (2009)	Kuwait	Survey Questionnaire	80 CFOs	IRR, NPV and PB are (in this order), WACC / CAPM are commonly-used to determine the cost of capital.
Khamees et al. (2010)	Jordan	Survey Questionnaire and Interviews	53 industrial firms	2/3 of firms used at least one technique; however, most of them used more than one technique. The most common techniques are PI and PB respectively. Discounted and non-discounted techniques are preferred equally. Just under 2/3 of firms applied risk analysis. Post-audits used by 84 per cent of the firms.
Al-Ajmi (2011)	Bahrain	Survey Questionnaire	150 financial institutions	DCF widely used, IRR is most commonly-used followed by NPV and ARR respectively. Cost of debt and WACC are preferred methods for determining the cost of capital.

Note: MENA: Middle East and North Africa**; GCC:** Gulf Cooperation Council; **JSE:**Johannesburg Securities Exchange. **NSE**: Nigerian Stock Exchange. **ESM**:Egyptian Stock Market.

gave the same level of importance to both DCF and non-DCF techniques. However, in terms of individual techniques, the firms used the PI, payback and the IRR (usage rates of 61.4, 58.6 and 55.7 per cent, respectively) (Khamees et al., 2010).

What Table 2.4 demonstrates is that Libya should provide an interesting research site for investigating the investment appraisal processes followed by Libyan companies; the topic has not been examined in Libya to date. Further, Table 2.4 suggests that a number of research methods, including interviews and questionnaires, may yield useful findings; they have been successful in previous studies in other African countries.

Table 2.5 compares the findings of the main studies about the techniques used by South African and MENA firms when evaluating investments; this table compares the evidence from the two questionnaire-based studies.[25]

A visual inspection of the results in this table reveals that the most popular methods for evaluating investment are NPV and IRR; the PB method was third. Thus, the results of African and MENA countries are very similar to the findings documented for developed nations such as the US and the UK. In the case of all the techniques, the Correia and Cramer study reported a higher level of usage; this suggests an increase in the use of these techniques over more recent periods. The rise in the use of payback from 40.6 per cent to 53 per cent may reflect the extent to which this technique is employed as a support tool alongside other techniques; it may also be used as a simple approach to gauge the risk of an investment (Toit and Pienaar, 2005). The PI decreased in usage from 10.9 per cent to 7.1 per cent while

[25] The response rates for the Toit and Pienaar (2005) and Correia and Cramer (2008) studies were 13 per cent and 8 per cent respectively.

Modified Internal Rate of Return (MIRR), which avoids the reinvestment assumption problem associated with the IRR, also decreased in popularity by almost half.

Toit and Pienaar (2005) found differences across industries in the usage of the different techniques; as many as 87.5 per cent of mining firms used DCF methods (IRR and/or NPV). By contrast, nearly 40 per cent of financial firms employed non-DCF techniques. However, firms from the closely-related insurance sector used both NPV and Present Value Payback (PVPB) extensively as well as the IRR. In terms of the role of capital budget size, both studies reported that firms with larger capital budgets relied more on DCF techniques as a tool for evaluating investments[26].

Correia and Cramer (2008) compared their findings with Ryan and Ryan's (2002) results for US firms, and reported that firms in both countries focused mainly on NPV, IRR and the PB period (in this order). In terms of risk assessment, Correia and Cramer[27] discovered that scenario analysis (71.4 per cent), sensitivity analysis (67.9 per cent) and break-even analysis (50 per cent) [28] were the three most commonly employed techniques. When asked about the use of real options and other sophisticated techniques, Correia and Cramer reported that the use of Adjusted Present Value (APV) and Economic Value Added (EVA) was fairly limited - similar to the results of studies in developed nations.

[26] Toit and Pienaar also noted that while more than 80 per cent of firms with a capital budget of more than R50 million employed DCF as the main evaluation technique, the rest of the firms in the sampled tend to use other techniques.

[27] Other risk assessment measurement were less popular; simulation (Monte Carlo) analysis was used by 14.3 per cent; abandonment or expansion option analysis by 14.3 per cent; decision trees by 10.7 per cent; and other techniques by 3.6 per cent.

[28] As regards capital structure, about 57 per cent of firms in the Correia and Cramer study reported having no (or a flexible) target for the debt-equity ratio. While 43 per cent of firms had a tight or strict target, 90 per cent of the firms targeted a debt-equity ratio of somewhere between 0 per cent and 60 per cent, suggesting a relatively low level of reliance on use debt among SA firms.

Table 2.5: Summary of Evidence on Investment Appraisal Methods.

Authors (year) | Method	NPV	IRR	PB	D-PB	ARR	PI	MIRR	Hurdle Rate	EVA	APV	Real Options	Earnings Multiple
Libyan Studies												
AlObeidi (1985)	10.5%	5.3	5.3%	NA	NA	5.3%	NA	NA	NA	NA	NA	NA
AlWakil (2000)	14.0%	5.0%	74.0%	NA	35.0%	26.0%	NA	NA	NA	NA	NA	NA
South African Studies												
Toit and Pienaar (2005)	71.9%	71.9%	40.6%	23.4%	35.9%	10.9%	14.1%	NA	NA	NA	NA	NA
Correia and Cramer (2008)	82.1%	78.1%	53.6%	25.0%	14.3%	7.1%	7.1%	67.9%	14.3%	7.1%	10.7%	46.4%
UK Studies												
Pike (1996)	74.0%	81.0%	94.0%	NA	50.0%	NA	NA	NA	NA	NA	NA	NA
Arnold and Hatzopoulos (2000)	84.%	83.0%	77.0%	NA	66.0%	NA	NA	NA	NA	NA	NA	NA
USA Studies												
Graham and Harvey (2001)	74.9%	75.7%	56.5%	28.5%	20.0%	11.0%	NA	55.5%	NA	10.5%	25.5%	NA
Ryan and Ryan (2002)	96.0%	92.1%	74.5%	56.7%	33.3%	43.9%	21.9%	NA	73.8%	NA	NA	NA

Note: **NPV:** Net Present Value; **IRR:** Internal Rate of Return; **PI:** Profitability Index; **MIRR:** Modified Internal Rate of Return; **ARR:** Accounting Rate of Return; **D-PB**: Discounted PayBack. **EVA**: Economic Value Added. **APV**: Adjusted Present Value.

One final result from Correia and Cramer [29] was that 71.4 per cent of the firms formally measured the cost of equity, with most using the CAPM. Moreover, the study documented that the equity market risk premium was about 5 per cent, with betas drawn from Bloomberg (25 per cent of firms), Cadiz/UCT (25 per cent) and McGregor (19 per cent). While 53 per cent of firms used a unique risk premium added to the cost of equity, the other 47 per cent did not; they relied on a more subjective assessment of the discount rate when evaluating their investments.

As with Correia and Cramer's (2008) study of South Africa, El-Shazly (2004) provide evidence regarding the analysis of real options in the investment decision process in the case of Egypt. The main finding of El-Shazly's study was that the incorporation of the real options approach into investment decision-making under uncertainty provides tangible benefits for Egyptian businesses. In addition, when the real options approach is accompanied by a diffusion-jump process[30], the behaviour of investors under uncertainty can be modelled closely.

The Nigerian survey by Elumilade et al.(2006) employed interviews (combined with historical data from the Nigerian Stock Exchange (NSE) Fact Book) and achieved an extremely high response rate of close 94 per cent, across 11 industrial sectors. The most commonly employed technique was found to be payback, although usually in combination with other methods. Many firms reported using

[29] Correia and Cramer (2008) suggested that firms may use the profitability index to rank projects when they face capital rationing. However, capital rationing is not examined in detail in any of the African studies in contest with developed nations as detailed latter in the chapter.

[30] Jump-diffusion models were introduced by Robert C. Merton. Diffusion-jump process in option pricing, is a method which mixing two models a jump process and a diffusion process. In a jump-diffusion process, a company can default instantly for a reason related to an unexpected drop in its value. Using this characteristic, a jump-diffusion process can match the size of credit spreads on company bonds and can generate various shapes of yield spread curves and marginal default rate curves, including upward-sloping, flat, downward-sloping and hump-shaped, even if the company is at this time financially in good standing (Rockingera and Semenovab, 2005).

non-DCF and DCF techniques together; for instance, 52.1 per cent of firms used three methods (such as payback, ARR and NPV; or payback, ARR and IRR) while 42.5 per cent of firms employed two techniques (especially payback and IRR or payback and NPV).

In terms of risk measures, a majority of the Nigerian firms in their sample had formal criteria for assessing risk, with just 13.8 per cent of firms claiming not to measure it. One third of the firms reported assessing risk on a subjective basis; while 22.3 per cent and 11.7 per cent used the "probability of obtaining a loan" or the "probability distribution of cash flows", respectively to quantify the risk of an investment project. The study reports further than 50 per cent of Nigerian firms employed a shortened payback period to control for risk while 30.9% raised the IRR for risky proposals.[31]

Gilbert (2005) studied two specific capital investment decisions made by two South African firms between January and December 1998; these two companies were chosen out of ten which agreed to make their investment project information available for the research; these two firms were selected on the basis of three factors which are: firm size; the importance of the decision for the company and the quality and amount of information, (including access to interview the relevant decision-makers) provided for the researcher. The two firms operated in the textile and paper manufacturing sectors. Gilbert (2005) conducted interviews with those involved and examined key documentation. In both cases, DCF techniques were found to play an important role in the analysis. However, the difficulties and costs of employing these methods were shown to cause some problems with their usage. In addition, the

[31] Other findings of note in this study included evidence of an emphasis on the importance of the stock market in the investment decision-making process and the positive influence of net cash inflows on investment decisions (Elumilade et al., 2006).

competitive environment - and firms' strategic reactions to it - had an important contextualising role in terms of the decision process.[32]

Another South African study by Hall and Millard (2010) reported that the return on investment (ROI) was the most common method for evaluating investments among the firms in their sample (it was used by 33.3 per cent of the firms). Another interesting point from this study was the trend towards a preference for NPV over the IRR in previous studies was not detected; the majority of companies in this study preferred to use IRR more than NPV. In terms of appraisal techniques in general, the most used techniques were return on investment, NPV and PI with usage rates of 33.3 per cent, 28.6 per cent and 23.7 per cent respectively. The other finding to emerge from this study was that non-financial criteria playied a more important role in these firms' capital investment processes. In addition, the firms reported that sensitivity analysis was the most popular approach for incorporating risk into the capital budgeting process (used by 29.2 per cent); this was followed by adjusting the required rate of return (28.6 per cent) and the PI (23.7 per cent), respectively (Hall and Millard, 2010).

Elijelly and AboIdris (2001) compared the capital investment techniques used in two sectors; commercially oriented public firms and private firms in Sudan. The results of this study showed that most of the sample firms in the private sector used investment appraisal techniques, while a majority of the public sector firms in the sample did not. Elijelly and AboIdris's survey reported that the most used technique

[32] Gilbert identified a five-stage investment decision-making process in the projects which he studied. While King (1975) identified six stages, and Chan et al. (2001) suggested seven stages, fewer steps were present for the two African firms. Gilbert identified five stages, in contrast to the earlier studies from developed nations. In both cases, Gilbert suggested that qualitative factors dominated the process, reflecting the over-riding importance of firms' strategic goals.

in both sectors was the PB; the IRR came second in the private sector while NPV was ranked second in the public sector (Eljelly and Abuidris, 2001).

In summary, the studies outlined in this section suggest that there are some differences between African and developed nations in terms of the importance attached to various investment appraisal techniques, such as payback. However, the dominance of NPV, IRR and payback appears to be a global phenomenon, although the literature on the continent is dominated by South African studies and analysis is needed on the extent to which new approaches such as the real options approach are used. Recent developments in African nations also makes this topic worthy of study, where very little is known about the investment decision-making process in practice. Libya, despite its (oil-based) wealth has received virtually no attention in the substantive literature. The increasing importance of Islamic Finance as highlighted in the previous section is one area worthy of investigation.

In Libya, only two unpublished studies have been written about the current topic; both were in MSc dissertations. In particular, AlObeidi (1985) surveyed 24 firms in the Libyan industrial sector. The study reported that 73.6 per cent of the companies in the sample assessed capital investment projects subjectively, while only 26.4 per cent of the sample used objective methods to decide on new capital investment projects (DCF techniques such as NPV and PI were used by 15.8 per cent of the sample while Payback and ROI were used by 5.3 per cent of the firms) (AlObeidi, 1985). In the second study by AlWakil (2000), 43 firms in four sectors (Commercial, Industrial, Agricultural and Service sectors) were surveyed. The study reveals that 74 per cent of the sample used the payback method and 35 per cent used the ARR, while DCF techniques such as PI, NPV and IRR were only used by 26 per cent, 14 per cent and 5 per cent respectively (AlWakil, 2000).

2.10 Other Developing Countries

Number of studies about capital budgeting practices in other developing nations are worth being mentioning. Verma et al. (2009) studied the capital budgeting practices of manufacturing firms in India. In this study, Indian manufacturing companies preferred to use NPV and/or IRR at first followed by the payback in second place. In terms of incorporating risk in the capital investment process, sensitivity analysis was used by a majority of the firms (use by 86.7 per cent) to assess the risk associated with the proposed projects (Verma et al., 2009). This finding differs from evidence in two previous Indian studies by Anand (2002) and Larla (2006). These studies showed that NPV was third most popular, after PB and IRR. Hermes et al. (2007) surveyed and compared 300 Chinese and 250 Dutch firms. The finding suggested that while Dutch firms mainly used NPV and IRR, the Chinese firms primarily employed IRR and PB. An Argentinean survey by Pereiro (2006) documented that the NPV method was used by 100 per cent of the firms. IRR came second, while PB was used by only 32 per cent of the firms studied. Finally, a study by Kester et al. (1999) covered six countries (Australia, Hong Kong, Indonesia, Malaysia, the Philippines and Singapore) reported that DCF methods were generally the most used, followed by PB, although in Hong Kong the latter was most popular.

2.11 Conclusion

This chapter has provided a detailed review of part of the vast literature on corporate investment decision-making most related to the current thesis. The chapter has highlighted the dominance of UK/US analyses and the shortage of extensive

investigations of the developing world. The material has highlighted issues associated with the techniques used, the structure of the process, the handling of risk, the role of options theory and Islamic finance. The investment appraisal process is a wide range of tasks and phases in practice not just the employment of appraisal techniques. These stages and tasks may happen in sequence, but each capital investment is relatively unique and some of these stages may not be necessary. However, the substantive literature focuses mainly on the assessment phase or on the usage of different appraisal techniques. A number of authors have suggested that there are other vital stages, which should be given more attention in the substantive literature such as the monitoring and control of expenditure during the implementation stage, on-going monitoring of the project and post-auditing of the investment.

Early studies documented a gap between the theoretical conception and usage of investment appraisal techniques in practice. However, over the last two decades, this gap has narrowed significantly. In addition to the investment appraisal techniques, there are several topics, which are directly related to the investment appraisal process, which have been covered in this chapter, such as risk, capital rationing, real options theory and investment in advanced manufacturing technology (AMT).

The next chapter provides a detailed description of the Libyan context, again focussing on the issues most pertinent to the later empirical analysis.

Chapter Three

The Libyan Economic Environment

3.1 Introduction

Social, political and historical events play key roles in shaping an economic environment as well as a country as a whole. In addition, an understanding of the factors which influence the economic environment of a country provides a strong basis for interpreting and analysing the results of a research study (Saleh, 2001; Matook, 2009). Accordingly, this chapter is designed to supply the reader with an over view of the Libyan State in terms of the important historical, social and political turning points in the history of its economic development. Such a background should help the reader of this thesis to contextualise the research questions being addressed and to comprehend the findings that are arrived at. The chapter therefore seeks to provide a backcloth against which the rest of the thesis can be understood.

Following on from this introduction, there are six sections in the remainder of the chapter. The following section gives an overview of the geographical layout of the country; the climate is discussed since this plays a key role in determining where businesses locate and how goods are distributed. Section 3.3 provides a description of the demographics of Libya including details about the population, the religion and the language of the citizens. Section 3.4 supplies a brief summary of the historical and political influences on the development of Libya; both of these influences have played an important role in determining the current investment environment within the country. Section 3.5 of this chapter describes the main historical development of the education system in Libya; emphasis in this section will be placed on the education of business students who form the majority of financial managers within the country. Section 3.6 discusses the Libyan economy in some detail; this section is divided into two main parts. The first focuses on the Libyan economy before the

discovery and production of commercial quantities of oil while the second concentrates on the Libyan economy after oil started to be exported in commercial amounts. Because the discovery of oil transformed the economy in such a dramatic fashion, it was felt that both eras had to be analysed separately. The second part of Section 3.6 is spilt into three subparts: the period when free-market policies were followed; the period of nationalisation following the rise to power of the Socialist People's Party; and finally, the period which has seen a return to free market policies. Section 3.7 concludes this chapter.

3.2 Geographical Location

The official name of Libya is the Great Socialist People's Libyan Arab Jamahiriya; it is one of the six Arab countries along the Northern coast of the African continent. As Figure 3.1 shows, Libya has a central location with a lengthy coastline along the Mediterranean Sea on the Northern shore of Africa (OBG, 2008). As a result, trade has always been a feature of the Libyan environment since before Roman times when ships sailed between Tripoli and Italy. In addition to the Mediterranean Sea in the North, Libya has land borders with six countries: Egypt on the East, Sudan on the Southeast, Chad and Niger to the South and Algeria as well as Tunisia on the West. Libya has an area of about 1,759,540 sq. km (U.N., 2003), which is around the size of both France and the UK combined (OBG, 2008). This places it seventeenth in size among all countries that currently exist throughout the world (CIA, 2009).

Figure 3.1 Map of North Africa and Middle East.

Source: CIA World Factbook, 2009.

However, 95% of this area is desert or semi-desert where rain often does not fall for many years; thus, only one per cent of the land involves urban habitation while the remaining four per cent is economically exploited for agriculture (Gurney, 1996). Tripoli is the capital of Libya and is located in the West of the country; Benghazi is the second major city of Libya and is located in the East of the country. Libya has a Mediterranean Sea climate in the North with mild Winters and hot Summers. By contrast, most of the country to the South of the coastline (the interior area) has a desert climate; it has dry warm Winters and very hot Summers (Country-Data.com, 1987).

3.3 Population, Religion and Language

In the general census of 2006[33], the Libyan population was 5,673,000[34]; thus the overall population density is only about 3 people / sq. km (GAI, 2006); about 3% of this population were citizens from foreign countries who were working mainly in the oil and gas sectors. A majority of the population (90%) lives within 10% of the area of Libya along the Mediterranean Sea coastline. Indeed, about one third of the population is concentrated in the two major cities of Tripoli and Benghazi. The main ethnic component of the Libyan population is Arabic although a number of other ethnic groups are present in the country (e.g. Berber[35] and Tebu (OBG, 2008)).

[33] 2006 is the last year when an official census was carried out in Libya; thus, data from this census is discussed here.

[34] The total number of people included in this population includes 336,798 non-Libyan citizens (CAI, 2006).

[35] People have lived in North West Africa since 2000 BC. Their other name is Imazighens which means in their language free people. The name of the Berbers came from the Romans who occupied the north of Africa at that time (Courtney-Clarke, 1996).

Table 3.1 shows the growth of the Libyan population between 1954 and 2006. An analysis of this table shows how the population has increased - especially since 1973. This growth is linked with the increased wealth of the country following the discovery of oil. Not surprisingly, the discovery of oil attracted many non-Libyan workers to the country who were employed by foreign exploration companies. In addition, the increasing wealth of the country probably allowed the average family size to rise since the large number of children could be supported by the higher wages earned by parents (typically the father). Further, an increased investment by the State in health care allowed the child mortality rate to fall, further increasing the population within the country (Kilani, 1988).

Table 3.1 Growth of Libyan Population.

Year/Nationality	Libyans	Non-Libyans	Total
1954	1,041,599	47,274	1,088,873
1964	1,515,501	48,868	1,564,369
1973	2,052,372	196,865	2,249,237
1984	3,231,059	411,517	3,642,576
1995	4,413,033	396,032	4,799,065
2006	5,320,894	336,798	5,657,692

Note: The table shows the growth in the Libyan population from 1954 to 2006 including both Libyans and non-Libyans. The date for which the population is reported represent the years in which a censuses was held.
Source: General Authority of Information: (GAI 1954, 1964, 1973, 1984, 1995, 2006)

A majority of the population is Muslim[36]; about 97 per cent of the country's citizens practice this religion. Islam is the official religion of the State, although freedom to worship any religion is guaranteed in the constitution (Mahmud, 1997) for both Libyan nationals and non-Libyans alike. Thus, the Coptic Orthodox Christian Church is the second largest religious grouping among the Libyan population (OBG, 2008).

Arabic is the official language of Libya and the main language used within the country; because of its colonial past, English and Italian are also spoken - especially

[36] Between 90% to 95% of Libyan Muslims follow the Sunni version of Islam and the rest are followers of the Ibadism Islam (OBG, 2008).

in the major cities. In addition, a number of unofficial languages are used by some Libyan ethnic groups (e.g. Touareqs speak the Tamasheq language and Imazighens speak the Tamazight language) but these tend to be unique to tribes which inhabit the desert area (Courtney-Clarke, 1996; OBG, 2008).

3.4 Historical and Political Overview

On 24th of December 1951, Libya was declared an independent nation by the United Nations. During the three thousand year period prior to independence, the history of Libya was the story of occupation and colonisation. Throughout its history, Libya was occupied by different civilisations beginning with the Phoenicians, the Greeks, imperial Rome, and the Byzantine Empire (Kilani, 1988; Mahmud, 1997). During the middle ages, it was part of the Islamic Arab Empire[37] ruled initially by Spain and then by the Ottomans from Turkey. From 1911, it was part of Italy while after World War II, it was administered jointly by British and French forces (McGuire, 1964; Steel, 1967; Nyrop, 1973).

Since independence, Libya has adopted three distinctive forms of political structure: the United Kingdom of Libya (later renamed the Kingdom of Libya) between 24 December 1951 and 1 September 1969; the Libyan Arab Republic until 2 March 1977; when the current State came into being and the name of the country was changed to Libyan Arab Jamahiriya[38] (Wright, 1981). In the first of these three

[37] The Islamic Arab civilisation had a significant impact on the culture, language and religion in Libya and the whole of North Africa. In fact, the Arabs were able to do what other civilisations, which occupied the area before them, were able to do (Steel,1967).

[38] The term "Jamahiriya" means a State of the masses, which is considered as a phase to signify the political development of the modern State beyond the stage of the Republic (Wright,1981).

time periods, when a monarchy ruled life in the country, Mahmud (1997) pointed out two major developments:

> *"…The first major development of the new State was its admission to the Arab League in March 1953. The second major development indicated the close links of the new State with Western Europe, and the economic difficulties which it faced. The main problem for the new regime by that time was to ensure that enough funds from abroad should be available to meet the normal expenses of the State and to pay for much-needed improvements…"* (p.112)

The political system in Libya in the period from independence until 1969 was based on a system of parliamentary government with a monarch at its head (El-Shukri, 2007). This system was established under the Libyan Constitution of 7 October 1951 (Kilani, 1988). Such a system of government was hardly surprising as the country had strong relationships with the UK, the US, Italy and France; the country still looked to former colonial powers for support and advice. Indeed, Libya's links with communist States was less prominent at that time (Mahmud, 1997). The Parliament consisted of two chambers: the House of the Senate and the House of Representatives. The House of Representatives represented the Libyan population at large and members were elected under the one-person-one-vote system. The House of the Senate consisted of 24 members, 16 of whom were appointed by legislative councils from the provinces while the remainder were appointed by the King (El-Sharif, 2005). Thus, in the period between 1953 and 1969, the Libyan political system took the form of a monarchy where parliament had responsibility for certain decisions. However, this dual responsibility for government had its own problems. According to El-Sharif (2005):

> *"In the first two decades after independence, tribalism grew rapidly. The exercise of political rights in a country where illiteracy dominated – and where political parties were very poorly organised – required the*

electors to turn to their original tribes. Ministers and officials were also chosen from notable tribes as well as from powerful families."(p.46).

This tribal loyalty lessened support for the King since he was not seen as belonging to any one tribal grouping. Further, the notion of a "King" was relatively alien to Libyan subjects who had previously associated the idea of a monarchy with a distant colonial ruler. It was not too surprising therefore when this system of government - which had no great support among the population – was overthrown in a coup by junior officers within the army during 1969 (Kilani, 1988). The political system in Libya changed to a Republic after a military revolution on 1st September 1969. Mahmud (1997) described this event as follows:

"…The Libyan revolution was exceptional for the absence of opponents, relatively few arrests, almost no fighting and no deaths reported." (p.112)

A Revolutionary Command Council (RCC) replaced the government and announced the introduction of a new political system; in addition, the name of the country changed to the Libyan Arab Republic. The business environment of the whole country witnessed a number of fundamental changes during this period; for example, a new constitution was adopted and a policy of Arab nationalism was promoted[39]. Kilani (1988) described these changes as follows:

"The provisional constitution, announced in November 1969, stated that supreme power would remain in the hands of the RCC. The principal force underlying the revolution's policies was Arab nationalism. This led to strict laws requiring businesses operating in Libya to be controlled by Libyans, with banks being particularly affected, and most of the European and American specialists were replaced by Arabs. Freedom, socialism and unity were declared to be the principles of the revolution." (Kilani, 1988) (p.24)

[39] This rise in Arab nationalism within Libya was hardly surprising since it followed the rise of Nasser's popularity as leader of the 1952 revolution in Egypt and the spread of his ideas, which called for the unification of the Arab countries into a single centralised State (Kilani, 1988).

In 1976 the RCC issued a decree which established the General National Congress of the Arab Socialist Union (ASU); this was to be the only political party allowed in the State. Following its first meeting, the General National Congress of the ASU changed its name to the General People's Congress (GPC). Subsequently, the leader of the revolution declared plans for fundamental constitutional reforms led by the GPC in 1977. The official name of the State was altered to the Socialist People's Libyan Arab Jamahiriya and authority was vested in the people through the GPC. The General Secretariat of the GPC was established to replace the RCC. In addition, the Council of Ministers was replaced with the General People's Committee, which set up branches at a local level (Kilani, 1988).

The most remarkable event in the 1970s was the issue of the Green Book by the leader of the Libyan Revolution - Mr. M. Al-Gaddafi. This Green Book established the Third Universal Theory[40] (TUT), which reflected his vision of a new political, economic and social system. This vision has influenced the whole political, economic and social development of Libya over the last three decades. For example, Vandewalle (1998) argued that:

> *"The Green Book clearly represented a turning point for the Libyan revolution: it was the guideline to a new political and economic system for the country"* (p.91).

The Green Book was divided into three parts. The first part dealt with the political component of the TUT and provided a solution to the democratic crisis which, it argued, existed in the world; for example, the cancellation of parliamentary

[40] It was presented as the third political, economic, and social theory after the theories of capitalism and communism (Al-Gaddafi, 1977).

representation and the transfer of power to the individual level; every individual was able to represent him/herself without the need to give their vote to anyone else. This system was argued to represent the "final solution" to the eternal conflict between the rulers - the politicians who represent the people - and people themselves. It offered the vision of a democracy where all people could participate in political life and be involved directly (individually) in the decision-making process, without the need for a delegated representative to take decisions on their behalf (Al-Gaddafi, 1977).

The second part of the Green Book related to the economic ideas underlining the TUT; these were based on the simple concept that political freedom is meaningless without economic freedom. In this part of the book, Mr. Al-Gaddafi argued that economic freedom could be achieved through socialism. Drawing on this notion that socialism would foster economic freedom, government policy developed; the government adopted ideas from this part of the Green Book which directly affected the activities of private businesses in Libya; they were replaced by a system of common ownership (public enterprises); in other words, they were nationalised[41]. For instance, banks, insurance, and petroleum marketing companies were all nationalised in the early 1970s (Kilani, 1988; Mahmud, 1997). In addition,

[41] For example, the nationalisation of the oil industry in Libya was initiated in 1971, when the two divisions of international oil companies, the British Petroleum Company and its American partner Nelson Bunker Hunt were nationalised. All the assets and operations of these nationalised firms were taken over by a newly-established Libyan oil company named "Arabian Gulf" (Libyan Government, 1971, 1973a, 1973b). Another national oil company called "Umm AL Jawaby" was established to take over all the shares of the Libyan American Oil Company and the American Oil Overseas company when their oil operations in Libya were nationalised (Libyan Government, 1974a, 1974b). The American oil firms (Occidental, Conoco, Marathon and Amerada Hess) accepted the NOC's new terms for participation agreements in which the Libyan Government represented by the Libyan National Oil Corporation (NOC), would hold about 51 per cent in all exploration licences. By contrast, the American majors (oil firms such as Exxon, Mobil, Texaco and Standard Oil of California), in addition to the Royal Dutch/Shell company, rejected these new participation agreements. Consequently, the Libyan government transferred 51 per cent of the assets and operations of the four American majors and all assets and operations of Royal Dutch/Shell to the NOC (Libyan Government 1973c, 1974a, 1974b, 1974c; MEES 1973a, 1974a, 1974b, 1974c; PI 1974).

restrictions were placed on commercial and industrial activities by foreign enterprises within Libya[42].

The third part of the Green Book discussed the social component of the TUT; it mainly focused on the principle of social equality and how it might be implemented (El-Sharif, 2005). Thus, Libya was different from a lot of other Arab countries in providing education for all of its children (both male and female) and promoting the role of women – who were seen as equals.

The radical changes in ideology brought about by the implementation of the TUT fundamentally altered the governance of Libya. It forced Libyan governments during the 1970s, 1980s and 1990s to change the political, economic and social institutions within the country. In particular, the economic philosophy of the State shifted from capitalism to socialism (Kilani, 1988; Mahmud, 1997; Kribat, 2009). These changes influenced the Libyan private sector as well as foreign businesses in the country. In addition, Libya's foreign policy gravitated toward communist countries and away from capitalist nations; this shift in policy affected Libya's relationship with Western countries for over three decades. Moreover, in 1992 the deteriorating relationship between Libya and Western countries resulted in economic sanctions being imposed initially by the US and then by the UN in 1985 (Mahmud, 1997; Kribat, 2009). The US sanctions were based on the belief that Libya generally supported international terrorism; they had a direct impact on Libya both financially

[42] From the late 1970s up to early 1990s, the entire economy within Libya was centrally planned, and the Government controlled both the production and service sectors (Mahmud, 1997). The Libyan commercial Code No. 65 of 1970 identified the foreign firms which were allowed to operate in Libya for a period renewable every five years. These firms were only permitted to engage in particular activities: (i) engineering consultants; (ii) technical support for the oil and gas sector; (iii) other sectors that were determined by the Government. By 1981 even all retail activities were controlled by government and all shops had become state-owned firms. The entire private sector was totally eliminated. It was replaced by people's economic committees, which ran the activities. This reached the point where even small businesses such as bakeries, butchers and barbershops were taken over by the state-owned sector (Kilani, 1988).

and otherwise[43] (Mahmud, 1997; El-Sharif, 2005). The UN sanctions were more specific, they were imposed when two Libyan nationals were accused of bombing a civilian airline over Lockerbie in Scotland (Mahmud, 1997; El-Sharif, 2005).

El-Sharif (2005) reported that the effects of these sanctions on Libya were severe:

> *"These sanctions cost Libya approximately $34 billion, and caused substantial damage in the humanitarian, economic and social spheres. In addition, all infrastructure development programmes and plans were adversely affected, thereby affecting Libyans' ability to achieve progress, well-being, development, stability, security and peace."* (p.51).

The UN and the US sanction were eventually lifted in 2003 and 2004, respectively. Since then, the State has made some progress in terms of economic reforms.

In 2003, the General People's Conference (GPC) issued Resolution No. 313 which approved a restructuring programme for the State-owned sector and expanded its ownership base. In addition it, (i) issued a list of selected State-owned industries and other economic activities where private sector involvement was to be permitted (No.31 of 2003), and (ii) published a schedule for the restructuring programme guided by a legal and administrative outline. The ownership of about 360 economic units, was transferred to the private sector under this programme, with a total asset value of approximately 8 billion LYD, and more than 100,000 employees. This programme was implemented during the period between 2004 and 2008 in three

[43] The sanctions banned all trade between the two countries (the US and Libya) and essentially froze all Libyan assets within the US. In addition, all of the American oil corporations that were operating in Libya had to terminate their operations and leave Libya by 1986. These sanctions against Libya have had a negative impact on Libya's oil and gas up-stream activities, which constitutes the main source of the county's income. In addition, other vital sectors such as civil aviation were also adversely (Mahmud, 1997).

phases (Masoud, 2009). This was the beginning of the privatisation process for State-owned businesses, allowing international firms to invest in Libya[44] (El-Sharif, 2005; El-Shukri, 2007; Kribat, 2009).

3.5 Education

Human resources are one of the main foundations for the development of a modern economy; they are the source of research, inventions, creativity and developments of new technologies. Education helps develop the human capital required for contemporary societies to advance (Alashehr, 1994). In this area Libya was fortunate to benefit from prior colonial administration. For instance, a modern school system was first established in Libya at the time of the Italian occupation (1911-1943). It was instigated for the purpose of teaching the Italian language and encouraging Libyans to adopt Italian culture and values (Hajjaji, 1967; Adajani, 1971). However, this school system was not targeted at all the population. Instead, education focussed on a process of transplanting Italian culture into that part of the Libyan population what worked with the Italian authority (Kilani, 1988).

A comprehensive expansion of the Libyan education system only occurred during 1945 under the British occupation when the colonial administration built schools to educate the Libyan people in Arabic; the first high school opened in Tripoli in 1947 (Hajjaji, 1967). In this period, there was a severe shortage of places at all levels of the education system. Indeed, at independence in 1960 there were only 10 Libyans who had a university Certificate and over 90% of the population

[44] It is worth noting that during 2001, the Libyan Government applied to join the World Trade Organisation (WTO) for the first time (El-Sharif, 2005; El-Shukri, 2007; Kribat, 2009).

were illiterate. Thus, there was a dearth of managers, technicians and qualified professionals in all the disciplines needed to advance the economic development of the State (IBRD, 1960).

At that time, the government depended on US and UK oil companies to provide the training programmes and expertise required for the conduct of the State's economic affairs (Farley, 1971). The University of Libya, which was the first university established by the State was only launched in 1956 with a Faculty of Arts and Education; the Faculty of Commerce and Economics was not added until 1958 (SP, 1993).

The dependence of the Libyan government on British and American aid in the area of education continued from the 1940s to the post-independence era. As a result, it is hardly surprising that these countries have shaped and influenced the educational system of Libya (IBRD, 1960; SRI, 1969; Kilani, 1988; Buzied, 1998). Nowhere is this influence more apparent than in the teaching of accounting, economics and business management. The British education system influenced the first accounting education institute in Libya, the accounting department in the Faculty of Commerce and Economics at Garyounis University (previously the University of Libya). For instance, this Faculty which was known as "the Faculty of Commerce at the Libyan University" adopted the British education system, which was based on a nine-monthly academic year, where students were assessed with end-of-academic-year final exams (Kilani, 1988). This Faculty of Commerce and Economics at Garyounis University played an important role in accounting education within Libya; it was the only Faculty that provided an accounting education programme in Libya between 1957 and 1981(Ahmad and Gao, 2004). After 1981, new Faculties of Commerce were set up at other third level institutions:

Al-Fateh University in Tripoli city and the Accounting Faculty in the city of Gharyan which is located 75km south of Tripoli city.

It is not surprising that the Faculty of Commerce and Economics at Benghazi University (Garyounis University, previously) adopted the British educational system; Libya was under British rule at this time. Indeed many of the teaching staff who were members of this Faculty were British or held degrees from Universities in the UK (Ahmad and Gao, 2004). In addition, the textbooks used were mainly from Britain[45] or Arabic translations of well-known UK books. Even those new texts that were written by academics were authored by individuals who had graduated from universities in the UK (Kilani, 1988; Mahmud, 1997).

In 1979, the accounting programme at the Faculty of Economics and Commerce at Garyounis University shifted from a British to a US model[46]. Mahmud (1997) attributed this change to the return of many PhD and Masters students from American universities during the 1980s. These new lecturers started to use either American textbooks[47] or Arabic translations of American books. In a small number

[45] For instance, the following British textbooks were listed as references for accounting courses in the Faculty of Commerce: (i) "Book-keeping and Accounts" by W. W. Bigg, H. A. R. J. Wilson, and A. E. Langton; London: H. F. L.(Publishers); (ii) "Cost Accounting" by Bigg, W. W; London: MacDonalds and Evans; (iii) "The Practice and Law of Banking" by Sheldon, H. P., and Drove, C. B.; London; (iv) "Management Accounting" by Batty, J.; London: MacDonald and Evans Ltd. (LU, 1972, pp. 60-77).

[46] In the academic year 1976/77 the Faculty of Economics and Commerce at the Libyan University adopted the American education system. The new system was based on two 16-week semesters instead of a full nine-monthly academic year. Under the new system, students are assessed according to the hours of modules passed, instead of assessing students based on a full academic year. In fact, the new system demand that the student earns credit hours of not less than 120 in order to graduate (GU, 1982, p.148).

[47] For example, the American textbooks that became the main references for accounting courses in the Faculty of Economic at Garyounis University included: (i) "Fundamentals of Financial Accounting" by Glen Wellsh and Robert Anthony. (ii) "Principles of Auditing" by Walter B Meigs, O. Ray Whittington and Robert F. Meigs. (iii) "Financial Statement Analysis" by George Foster (Kilani, 1988).

of instances, Arab academics who were educated in America wrote their own book upon their return to Libya (Mahmud, 1997).

After 1981, many other universities in Libya started to offer accounting programmes. However, the influence of the accounting department in the Faculty of Economics and Commerce at Benghazi University (Garyounis University, previously) continued to dominate business education; the textbooks which were written by its staff members tended to be used at other Libyan Universities and newly appointed staff members had typically graduated from Benghazi University (Garyounis University, previously) with their Bachelor and/or MSc in Accounting (Ahmad and Gao, 2004). The textbooks used, the topics covered and the techniques discussed are practically all drawn from the US and the UK. This situation persisted despite the fact that Libya was officially a Socialist State in the 1980s without any stock market or private sector. The influence of the US and the UK on the education system in the area of commerce is also surprising given the Islamic ethos within the country. Nevertheless, despite these apparent contradictions between the culture of the country and the educational system, it seems that there was very little change. In general, the current accounting education programmes within Libya as well as professional training in the area are influenced by the private sector and accounting environments in America as well as Britain (Ahmad and Gao, 2004).

Table 3.2 shows the number of individuals who held a college or university qualification in Libya (Libyan and non-Libyan) between 1951 and 2006. What is apparent from this table is the growth in graduate numbers since 1964. This growth

was especially pronounced between 1984 and 1995 as oil revenues were invested in new third level educational institutions[48].

Table 3.2 Number of holders of College or University Qualification in Libya

	Number of the Holders of College or University Qualification (Libyan and Non-Libyan)		
Year	Male	Female	Total
1951*	NA	NA	10
1964	5,882	391	6,273
1973	104,853	26,642	131,495
1984	164,424	72,448	236,866
1995	450,186	272,460	722,646
2006	658,594	717,709	1,551,018

Source:* (IBRD, 1960),General Authority of Information (GAI, 1964, 1973, 1984, 1995, 2006)

However, it has continued since 1995 with the graduate population doubling from 799,646 to 1,551,018. The other surprising feature of Table 3.2 is the number of female graduates. Female graduates increased by a factor of approximately four between 1984 and 1995. Indeed, by the end of 2006, the number of female graduates was higher than the number of males who had been awarded a qualification from a university or third level college. As the previous section of this chapter noted, this pattern of female participation in education makes Libya very different from many of its neighbouring Arab countries where girls are often not permitted to proceed beyond primary education (Ahuja and Filmer, 1995; Akkari, 2004).

3.5.1 The Accounting and Auditing Professions in Libya

Both the accounting education system as well as the accounting profession, in Libya trace their origins back to a period when the country was occupied by Western

[48] During this period, a major expansion through the creation of a number of new universities or set up branches of the existing universities, as well as the establishment of several specialist colleges.

colonial powers. Therefore, it is hardly surprising that accounting education and the accounting profession were influenced by Western colonial thinking; thus Western values were typically present in the accounting system (Annisette, 2000; Irvine, 2008; Shareia, 2010). In the case of Libya, business organisations were serviced by foreign accounting firms, initially from Italy and then from the UK because local accounting entities did not emerge until 1952 (Ahmad and Gao, 2004).

Even after 1952, the western influence in this area remained strong. Historically, most accounting firms which operated in the country during the 1950s and 1960s were branches of British or American organisations. Therefore, these accounting firms have influenced Libyan accounting and auditing professions; as a result they have tended to follow the same accounting standards as their counterparts in the UK and the US (Bait-El-Mall et al., 1973; Kilani, 1988). In particular, the Libyan accounting and auditing professions' choices about accounting rules mirrored decisions taken in the UK[49]. Indeed, the ineffectiveness and weakness of the Libyan Union of Accountants and Auditors (LUAA)[50] resulted in no local accounting and auditing standards being developed and professionals adopted Western accounting and auditing rules (Baker and Russell, 2003).

Despite the establishment of the LUAA in 1973, no code of ethics was laid down for its members. Even though this professional body was a self-regulating organisation, very little emphasis was placed on its public interest obligations. It

[49] The links with large US oil companies forced US accounting standards and US accounting treatments to be adopted in that sector during the 1960s (Kilani, 1988; Bakar, 1997).

[50] No prior exams were required before accountants were allowed to join LUAA and be licensed as chartered accountants and auditors. Even more, there is no formal mechanism to make sure that the accountant, who wants to join LUAA, has actually got a suitable form of training (Abouzkeh, 2012). However, as stated on LUAA the web page, membership of the LUAA reached 1900 members in 2013 (LUAA, 2013). There is no detailed information on record regarding the number of accounting firms operating in Libya or whether they are Libyan or international companies.

failed to organise regular conference seminars and training programs for the members (Baker and Russell, 2003). In addition, there are no local standards in Libya for either auditors or accountants to follow; hence members of the LUAA employed international standards (Bakar, 1997). Thus, Libyan accounting principles and auditing standards were adopted from other countries, and applied without taking into account any of the environmental factors unique to Libya (Shareia, 2010).

3.6 Economic Environment

This section discusses the most important stages in the history of the economic development of the Libyan State since it achieved independence in 1951. There is no doubt that the discovery of oil in the 1950s was a substantial impetus to the progress of the country's development. Commercial quantities of oil started to be produced from 1959; as a result, the economy grew and there was a rapid rise in per capita income from less than $40 a year in 1951 to $1,250 in 1968 (Bait-El-Mall et al., 1973). Accordingly, the post-independence economic history of the country is divided into two main periods: namely, the pre-discovery of oil period and the years after oil was discovered.

3.6.1 The Economic Environment before the Discovery of Oil

One of the most pessimistic descriptions of Libya's economic environment in the period before 1960 was provided by Benjamin Higgins[51]. In 1959, he described Libya's economic situation after independence but before the discovery of oil as follows:

> *"In 1952 Libya seemed to be an almost hopeless case. Its great merit as a case study is as a prototype of a poor country. We need not construct abstract models of an economy where the bulk of people live on a subsistence level, where per capita income is well below $50 per year, where there are no sources of power and no mineral resources, where agricultural expansion is severely limited by climatic conditions, where capital formation is zero or less, where there is no skilled labour supply and no indigenous entrepreneurship. When Libya became an independent nation ... it fulfilled all these conditions".* (Higgins, 1959) (p.26).

Based upon Higgins' description of Libya, the term 'developing country' appears to be an exaggeration when used to describe the economic situation at that time (Farley, 1971). Indeed, Higgins himself did not seem to believe that the economic development of the country could improve in the future:

> *"... if Libya can be brought to a stage of sustained growth, there is hope for every country in the world."* (Higgins, 1959) (p.26).

During the 1950s, Libya was described as one of the poorest countries in the world (Higgins, 1968; Wright, 1981; Gurney, 1996; Vandewalle, 1998). Public funds for that period were always in short supply and the Government's budget was typically in deficit before "Foreign Resources" were considered (BL, 1965). To survive during that time period, these deficits were usually underpinned by foreign

[51] Benjamin Higgins was a famous economist who specialised in economic development and who served as an economic consultant to the Libyan government in the early 1950s.

aid and financed by loans from other Governments in exchange for permission to retain British and American military bases in the country (Kilani, 1988; Gurney, 1996). For example, an analysis of Table 3.3 reveals that expenditure exceeded domestic revenue raised within Libya for the early years from 1954/55 to 1958/1959 before independence. Indeed, for some years (e.g. 1956/57) domestic revenue was less than 60 per cent of the Government expenditure which was incurred by the State.

The Libyan economy in the pre-oil period consisted mainly of two sectors: agriculture and animal husbandry; both of these represented 80% of economic activity within the country (Higgins, 1968). Alternative employment opportunities were very rare and confined to some textile industries, and a small number of handicraft factories (Bait-El-Mall et al., 1973).

Table 3.3 Government Revenue and Expenditure between 1954-55 and 1958-59 (In Million LP[52])

Year	1954-55	1955-56	1956-57	1957-58	1958-59
Expenditure	7.897	12.978	15.433	17.031	19.179
Domestic Revenue	5.549	7.061	8.147	9.595	12.049
Foreign Revenue	5.641	6.270	4.234	12.069	11.045
Total Revenue	11.190	13.331	15.381	21.664	23.094
Surplus or Deficit	3.293	0.353	(-0.052)	4.633	3.91

Source: International Bank Reconstruction and Development of Libya (IBRD 1960)

The very small industrial sector was concentrated mainly in the Tripoli area and represented by a number of small factories often owned by Italians. These factories usually involved activities associated with the processing of agricultural products such as the grinding of grain, olive oil presses and the packaging of dates. In

[52] The average exchange rates between the Libyan Dinar and the US Dollar during the 1961-1993 period ranged $2.3 to $3 (Mahmud, 1997)

addition to the tobacco industry, the manufacturing and packaging of salt took place (Gurney, 1996). Apart from these areas, some textile firms produced carpets and blankets while a few factories manufactured building materials. In these cases, the factories typically produced goods for domestic consumption rather than export. The only known sources of mining involved the extraction of small quantities of iron ore at Fezzan[53], and some gypsum in the area surrounding Tripoli; some other metals were mined in different areas but the quantities extracted were economically unimportant (Gurney, 1996).

The most significant economic event which took place at that time was the establishment of the Libyan Currency Commission in March 1951; this was the first monetary organisation to exist within the country (Kilani, 1988). The Libyan Currency Commission issued a new currency - the Libyan pound - for the first time in the history of the county; prior to 1951 the British pound had been the currency that was used. Later in April 1956, the Bank of Libya[54] started operating in Tripoli; it opened a branch in Benghazi during 1957 (CBL, 2006). What emerges from an analysis of the economic development of Libya prior to the discovery of oil is a small, agricultural-based country with very little industry. The population tended to be concentrated in two cities (Tripoli and Benghazi) with small villages dotted along the coast where water was present. The economic infrastructure was poor and only started to develop during the 1950s; previous colonial powers which had administered the area had concentrated on education rather than on establishing a

[53] Fezzan is one of the three states which formed Libya through their unity together in 1951 and is located in the South-West of Libya. It represents about one-third of the country's area.

[54] This institution later became the Central Bank of Libya and its main role is to issue notes as well as coins and hold the State accounts. It also regulates and supervises all banks operating in the State.

vibrant financial sector within the country. All of this "underdevelopment" changed in 1959 when oil was discovered in commercial quantities.

3.6.2 Economic Environment after the Discovery of Oil

One of the first impacts of the discovery of crude oil was an increase in investment by companies working in Libya. The second major change was on government spending; this also increased as crude oil revenue started to be earned. In fact, royalties from oil production and license fees became the primary source of Government funding from that time. Due to the increase in government spending, the demand for goods and services rose. In addition, the foreign oil companies that were working in the country made deposits in the commercial banks which allowed these institutions to lend to private businesses; these loans enabled local commercial and industrial firms to establish operations for the production and import of goods and services to supply the growing demand within the Libyan market. Because of these changes, bank lending within the country increased from 6.031 million Libyan pounds (MLP) in 1956 to 88.846 MLP in 1969 (Fayad, 2000; El-Sharif, 2005).

The discovery of oil resulted in a dramatic increase in Gross Domestic Product Per Capita Income; it rose from just under $40 in 1951 to $1250 by 1968 (Bait-El-Mall et al., 1973). This change allowed the newly independent State, which had been described as one of the world's poorest countries (Higgins, 1968; Wright, 1981; Gurney, 1996; Vandewalle, 1998) to develop quickly. However, despite the fact that GDP was high (See Table 3.4), Libya was still viewed as a developing country because most of its income came from a single industry, which was the oil and gas sector. Furthermore, a majority of the population did not benefit significantly from

the sizeable rise in GDP. The average GDP figures masked the fact that half of the population lived in poverty (Kilani, 1988).

As Table 3.4 shows, during the 1960s GDP rose dramatically driven by the export of crude oil. This increased the contribution of the oil and gas sector to the economy from 24.4 per cent in 1962 to 63.1 per cent in 1970. GDP continued increasing during the 1970s and the contribution of the oil and gas sector to the economy remained high; it fluctuated between 53.4 per cent and 61.8 per cent depending upon the price of a barrel of oil. During the early 1980s, GDP dropped. It fell from 6.9607 million Libyan dinars (LYD) in 1980 to 3500.4 million LYD in 1985 reflecting the decline in crude oil prices during that period (Mahmud, 1997; El-Sharif, 2005). In addition, the contribution of the oil and gas sector declined, as a result of US and UK companies closing their Libyan operations for political reasons (for example, the nationalisation programme of the 1970s and the US embargo on trade with Libya in the early 1980s) (Mahmud, 1997). In fact, the oil and gas sector's contribution fell from 61.8 per cent of GDP in 1980 to 31.7 per cent in 1995. From the middle of the 1990s and throughout the whole of the 2000s, GDP began to rise again - driven by the increasing price of oil and the return of crude oil production to previous levels[55].

GDP increased from $33,990.6m in 2000 to $42,471.6m in 2008, while the oil and gas sector's contribution to the total economic activity of the country rose from 42.1% to 52.5% over the same period. This percentage is still high compared with the contribution of other sectors of the economy.

[55] This increase in production was attributed to the return of US and British firms to Libya after the lifting of sanctions in 2003 (El-Sharif, 2005; El-Shukri, 2007).

Table 3.4 Libyan Gross Domestic Product (GDP) by Economic Sector from 1962 to 2008 (in Millions)

Year	*Oil and Gas sector in LYD		Non-Oil and Gas sectors in LYD		GDP in LYD	GDP in US$
	Value	%	Value	%		
1962	38.0	24.4	117.5	75.6	155.5	441.8
1965	270.1	54.9	222.0	45.1	492.1	1,033.8
1970	812.6	63.1	475.7	36.9	1,288.3	4,601.1
1975	1,961.1	53.4	1,713.2	46.6	3,674.3	13,122.5
1980	6,525.7	61.8	4,028.1	38.2	10,553.8	37,692.1
1985	3,500.4	44.6	4,351.7	55.4	6,960.7	24,859.6
1990	3,243.8	39.3	5,003.1	60.7	8,757.3	29,485.9
1995	3,380.0	31.7	7,292.3	68.3	12,372.3	35,148.6
2000	7,761.9	42.1	10,695.0	57.9	18,456.9	33,990.6
2005	38,153.0	70.0	16,384.8	30.0	54,537.8	40,249.3
2008	27,157.5	52.5	24,530.4	47.5	51,687.9	42,471.6

Source: Central Bank of Libya,(CBL 2007, 2008) , IMF report (1980 to 2008)and General Planning Broad reports for Economics and Social Indicators (1962-2000). **Note:** this table details Libyan GDP in Oil & Gas sector and other sectors in million Libyan Dinars (MLYD) and Percentage. In addition, in the US Dollar $.

***** Include refined petroleum Products, petrochemical Products and plastics.

In the 1960s, Libya was lacking in most of the basic requirements for a modern State. In particular, its infrastructure, schools, hospitals, housing, transport and communications all needed to be developed (Kilani, 1988; Mahmud, 1997). In addition, the country's reliance on oil and gas was continuing to grow; while this reflected the nation's natural resource base, the lack of diversity was seen as a weakness in the long-run, particularly given the unstructured and unplanned Libyan macro economy (Mahmud, 1997).

Sanger (1975) described the effect of the oil revenue on Libyan society during the early 1960s as follows:

> *"The cities had become construction camps with noisy bulldozers leveling buildings and cement trucks pushing through the traffic jams with loads for the ever-hungry building cranes which dominated the*

> *skyline. In and around the chief cities and towns rose block after block of new housing ... Hospitals of standard design were being built in half-dozen lots ... The giant campuses of the Universities of Tripoli and Benghazi were the most impressive in Africa. Above many side streets and garden suburbs the tall chimneys of new factories rose behind the minarets, their dark smoke clouds proof of the boom in cement, reinforcing wire, plumbing fixtures, textiles, food processing and, most successful of all, the drive to expand electricity"* (p.413-414).

As a result, the Government decided to take control of this unstructured development with the launch of a plan. The first development plan was approved in 1963; it was to last for five years and covered the economic and social development of the country. It was to use about 70 per cent of the oil revenue accruing to the State. This first five-year plan focused on the agricultural and industrial sectors, in addition to housing, transportation, communication, education and health services. It called for expenditure of 169.1 million LP[56]. However, an increase in oil revenue resulted in the real expenditure of this plan rising to 551 million LP[57]. The main sectors on which funds were spent included housing and public services (29.4 per cent), transportation and communications (16.6 per cent) and agriculture (11.9 per cent). A second five-year development plan was approved in 1967 and covered the period between 1969 and 1974. The plan proposed to allocate three times the expenditure of its previous counterpart and continued with the aim of achieving previously set goals. In addition, it provided for the development of a petroleum refining industry as well as the promotion of small businesses. While this plan was abandoned by the RCC after the 1969 revolution, it was replaced by a new three-year plan from 1970 to 1972, which allocated 30.5 per cent of expenditure for the

[56] In 1958, the unit of Libyan currency became the Pound (LP). However, the name was changed to the Dinar (LYD) following the publication of Act No. 63 of 1971, which gave the Central Bank of Libya authority to issue a new currency.

[57] The average exchange rates between the Libyan Dinar and the US Dollar during the 1961-1993 period ranged $2.3 to $3 (Mahmud, 1997).

housing sector, 17.1 per cent of spending for agriculture and 13.8 per cent of funds for industry. The other plans which followed during the 1970s called for expenditure of 11253.2 million LYD [58]; the priority in these subsequent plans was given to the agriculture and industrial sectors with 21.3 per cent and 14.7 per cent of expenditures allocated to these areas, respectively. Between 1973 and 1985, Libya adopted and implemented three- or five-year plans to promote economic and social development. However, After 1985, the use of plans declined; although the State attempted to follow development plans, some of them were either not implemented completely or never started[59]. The total expenditure on these relatively unsuccessful development plans during the 1980s amounted to 15184.3 million LYD, and their priorities changed slightly in favour of industry; 19.1 per cent of funds was allocated to the industrial sector and only 14.2 per cent to agriculture during this period (Allan, 1981; Mahmud, 1997; El-Shukri, 2007).

Despite all the difficulties which the Libyan economy suffered over the past 50 years, such as the radical change in the political and social philosophy of the Libyan government in the 1970s, the shift from capitalism to socialism, and the nationalisation of private and international businesses including banks and petroleum companies, GDP continued to rise (Kilani, 1988; Mahmud, 1997; El-Sharif, 2005; El-Shukri, 2007; Kribat 2009). However, during the 1980s this situation changed as the economy performed poorly due to a decision to allocate the economic and social development programme budget to the implementation of a

[58] In 1971, the Libyan currency was changed from the Libyan Pound to the Libyan Dinar.

[59] The political orientation of the Al-Gaddafi regime after 1985 did not give any detailed attention to economic development. The almost complete dependence of the country's economy on the oil and gas sector - mostly operated by foreign companies or partnerships between foreign companies and Libyan companies – may have made the regime think that there was no need for development plans. Instead the regime directed public money to be spent on the political goals of the regime, which were designed to reflect the general ideology of the Gaddafi regime.

single giant-size project - the Great Man-Made River project - and the abandonment of all other projects. In addition, the Government's attempt to curb the fiscal deficit (Fayad, 2000), and the US as well as UN economic sanctions in the 1990s, all badly affected the growth of the Libyan economy. For instance, the level of GDP decreased from $82.2 billion in 1980 to $34.5 billion in 1995 (El-Sharif, 2005; El-Shukri, 2007; Kribat, 2009).

In spite of several development plans during the last 40 years, Table 3.5 shows that the Libyan economy has failed to achieve a significant amount of diversification and a reduction of its dependency on the natural oil and gas extraction sector. The development of other sources of income such as, for example, the move toward a petrochemical industry based on the manufacture of refined oil has not been a success.

Although the Libyan State has been endowed with unique features and great potential, such as its strategic geographical location, its vast natural resources (oil, gas and solar) and its large area, its development has sometimes disappointed. The reason for this could be the small population which inhabits the country. Another reason might relate to the lack of water in the region; although the total space is large, a lot of this area is desert where no individuals can live (OBG, 2008).

However, a more fundamental reason for the disappointing development of the country may be the political changes experienced by Libya, which have had a detrimental impact on aspects of its political, economic and social life. Politically, the Constitution was abolished in 1973 and the functioning of the State became based on the instructions and speeches of Muammar Gaddafi (the leader of the coup in 1969) and his Green Book. The parliament was replaced with a system of People's

Congresses (Fayad, 2000; Edwik, 2007) which resulted in a very slow and cumbersome decision-making process.

Therefore, several observers have suggested that there are no longer any genuine representatives of the people who have power to monitor the government and to whom the government is accountable for its management of the State's resources (Zagoub, 2011). For example, there is no mechanism through which the outcomes of development plans are checked against targets (see Section 3.4). According to the economic ideas of the TUT (Al-Gaddafi, 1977) and the ideology which has ruled the Libyan State since 1977, profit-making is not encouraged; instead, the TUT talked about profiteering which was linked to the exploitation of society[60]. Therefore, the motivation underpinning economic activities has stressed the satisfaction of society's needs and the welfare of the people, but not the maximisation of the profit for a firm or the gain for an individual. Furthermore, restrictions have been put in place to limit the rights of individuals to own properties in excess of their needs such as real estate and movable assets; indeed, there is a prohibition on savings in excess of that which is needed for an individual or family (Al-Gaddafi, 1977).

All of these restrictions have had an effect on the implementation of recent development plans. The first five-year plan was not fully implemented after the coup in 1969; instead, it was followed by a three year plan from 1973 to 1975. The third plan was for five years from 1976 to 1980 and achieved a great deal of success

[60] "The recognition of profit is an acknowledgment of exploitation, for profit has no limit. Attempts so far to limit profit by various means have been reformative, not radical, intending to prohibit exploitation of man by man. The final solution lies in eradicating profit, but because profit is the dynamic force behind the economic process, eliminating profit is not a matter of decree but, rather, an outcome of the evolving socialist process. This solution can be attained when the material satisfaction of the needs of society and its members is achieved. Work to increase profit will itself lead to its final eradication." (Al-Gaddafi, 1977) (Part 2, p.30).

Table 3.5 Libyan GDP across Economic Activities 2005-2008 (Million LYD)

Economic Activities	2005	2006	2007	2008	Growth 2005-2008
Agriculture, Forestry and Fishing	1554.0	1649.8	1715.8	1749.9	16%
Mining and Quarrying	38673.0	23912.5	24321.7	25586.4	12%
Manufacturing Industries	1612.7	2358.5	2538.4	2754.7	22%
Electricity, Gas and Water	379.0	1001.7	1140.7	1254.7	36%
Building and Constructions	1803.0	2464.5	3078.2	3724.6	63%
Trade, Restaurants and Hotels	2892.0	2666.5	2960.8	3199.8	30%
Transport, Storage and Communication	2013.0	2786.5	3130.1	3411.8	38%
Financing, Insurance (except Housing)	579.0	748.7	843.5	885.6	31%
House Ownership and related Business Services	614.0	4310.8	4668.6	4813.1	16%
Public Services (Education and Health care etc.)	4682.0	4490.05	4590.26	4597.3	10%
Other Services	44.2	47.07	50.08	52.09	18%
Indirect Financial services	(308.1)	(304.6)	(328.9)	(342.09)	11%
Total GDP	**54537.8**	**46132.02**	**48709.24**	**51687.9**	**19%**
Oil and Gas and associated manufacturing industries *	38153.0	25380.80	25815.15	27157.5	12%
Non-Oil economic activities	16384.8	20751.22	22894.09	24530.4	16%

Note: This table details Libyan GDP across economic activities in 2005, 2006, 2007 and 2008.
Source: Central Bank of Libya (CBL 2007, 2008).
* Include refined petroleum products and petrochemical products and plastics.

in meeting its goal of promoting an element of diversity in the sources of income earned by the nation. The fourth plan which spanned a five-year period from 1981 to 1985 was less successful because of a change in political direction which led to a switch from the original objectives to the focus on a single large project (a man-made river). This project exhausted all the resources that had been allocated to the unrealistic plan imposed by the brother-leader Mr Al-Gaddafi, as well as those available for the implementation of further development plans after 1985. After this, there was a real commitment among the political decision-makers to implement outstanding elements of the brother-leader's plan or set up new programmes to hasten further development (Etturki, 1985; Kilani, 1988; Mahmud, 1997; El-Sharif, 2005; Edwik, 2007; El-Shukri, 2007).

Edwik (2007) highlighted the problems associated with these plans in the following paragraph:

> *"The main problem with all national development plans is that they do not suggest how, or at what pace, these objectives can be met. These plans are also missing the essentials capital information, the structure and characteristics of the economy, important development data, and designation of responsibilities. So far none of these objectives have been achieved. Perhaps, the lack of responsibility, commitment, credibility, the absence of feasibility studies and many other reasons account for the poor performance of any development initiatives. Despite a long-standing pledge to diversify the economy, Libya's progress in some major development areas, which the government plans encourage, has not been very impressive."* (p.97).

At the beginning of the 1990s, the Libyan government attempted to reform the economy and rebuild the private sector by encouraging local and foreign capital to invest in exciting, new projects within the country. A series of laws were issued which encouraged business activities at the individual level or in the form of joint ventures with foreign entities by removing barriers to the ownership of assets by non-nationals; this has been relatively successful. For instance, Law No.5 (1997) sought to encourage foreigners to invest in Libya; it was amended by Law No.7 (2003) and Law No.21 (2001) which aimed to regulate the rights of local investors in both individual economic entities and public (shareholding) companies. In addition to the issuance of these laws, the government has launched an extensive plan to privatise a large number of the State-owned companies in the public sector; some 145 plants in public ownership were transferred to employees in 1994; a further 295 plants which were owned by the State were privatised by giving shares to the employees during 1995 (LGPC, 2003). In addition to these developments, 360 plants in the industrial, agricultural, horticultural and marine sectors were subsequently privatised in three phases. The first phase involved 260 plants whose

shares were transferred to the employees during the period between 2003 and 2005. The second phase included 46 plants that were converted into shareholding companies and sold to private investors throughout 2006/2007. The third phase involved the privatisation of 54 plants during the period 2007/2008 (LGPC, 2003).

In June 2006, the Libyan government took a further step towards the establishment of a free market economy within the country; they promoted the openness and liberalisation of the Libyan economy as a part of their reform programme to support the private sector. This step involved the establishment of the Libyan Stock Market (LSM) under Resolution No. (134) (2006) issued by the General People's Committee (GPC) (the Libyan government) (LGPC, 2006). The LSM commenced operations in March 2007 with the shares of seven listed companies quoted; these included five banks and two insurance companies. Two of these were private companies (one bank - Bank of Commerce and Development and one insurance firm – Muttahida) while the rest had a mixed ownership structure (part State-owned and part private ownership by investors). It is worth noting that the LSM has not witnessed any significant developments in relation to the number of listed companies since 2007; only 14 companies in total were listed on the market at the end of 2010 and most of these were banks (LSM, 2012) [61].

In 2006, Mr. Saif al-Islam Al-Gaddafi, the son of the country's Leader Muammar Al-Gaddafi, announced a series of economic reforms (Zagoub, 2011; Abouzkeh, 2012). These economic reforms were contained in a national economic strategy document, which reflected an assessment of the Libyan economy's existing competitiveness and a future vision of what the Libyan economy should look like in

[61] Of the 14 companies listed on the market at the end of the first half of 2012; 7 were banks, 3 were insurance companies, 3 were investment and financial service firms (including LSM itself), and only 2 were manufacturing companies (LSM, 2012).

2019 (OBG, 2008). This report identified seven key themes which represented the main strengths and weaknesses of the Libyan economy. The first of these highlighted that Libya was the richest country in North Africa in terms of its large revenues relative to its small population size. In addition, it suggested that there was a relatively fair distribution of wealth among the people, at least outwardly. The second theme of the strategy document noted that there was a dearth of good management in the public sector which had led to the inefficient distribution of resources within the country: the quality of the education system and the public health system was poor while the housing sector was characterised by inadequate planning and inappropriate service provision. Indeed, it was argued that the development of urban areas had been plagued by uncertainty in relation to ownership rights over residential property. The third theme highlighted that most of Libya's income came mainly from the energy sector (oil and gas), while other sectors such as agriculture, transit-trade and tourism with high potential remained under-developed. The fourth theme documented that the energy sector had the highest productivity and employed only a minority of the official workforce. By contrast, other sectors had very low productivity and a sizable workforce employed (including healthcare, education and other services). The fifth theme suggested that the local private sector was constrained by an unproductive public sector and a very unfavourable economic environment, which prevented individual firms from increasing the productivity and wealth of the country. The sixth theme argued that despite attempts at reform of the unfavourable business environment and the anti-foreign direct investment culture, the role of foreign investment was still very limited. The final theme argued that the poor physical infrastructure of the country did not offer sufficient support to business and society in general; for example,

transport, information and communications technology and urban planning needed to be improved.

This document's vision of the Libyan economy in 2019 stressed the need for greater productivity. It set a goal for an employment level of 90 per cent arguing that the key resource of Libya was its people with highly productive activities and a strong work ethic. Internationally, it aimed to see the Libyan economy fully integrated with international markets; with a well-developed infrastructure, it suggested that Libya would establish more international links. Competitively, it sought to increase the contribution of non-oil GDP to LYD 50Bn; it stressed the need for diversification within the economy. It suggested that by 2019, foreign companies would compete to locate their operations in Libya, and Libyan firms would be internationally competitive (OBG, 2008).

It is worth mentioning that in the year when these economic reforms were announced and the national economic strategy of Libya was issued, the country was ranked 105 out of the 163 in terms of the corruption index produced by Transparency International (TI, 2006). In terms of global competitiveness, Libya was ranked at 110 out of 111 countries covered in a report issued by the World Economic Forum (2006). Thus, although reforms were being introduced and a strategic vision for the country was being articulated, Libya had a long road to follow. In fact, the evidence of progress towards the 2019 strategic was not encouraging (OBG, 2008).

In 2010, the extent of corruption within the country increased. Table 3.5 shows that Libya's ranking in the corruption index fell by more than 40 places; it was ranked 146 out of 178 countries. In terms of global competitiveness, some progress

was made in 2009-10. For example, Libya moved to a position of 88 before falling down again to be ranked 100 in 2010.

These reports suggest that proposals for economic reforms and the publication of a national economic strategy may have been part of a wider political propaganda rather than a serious attempt to change the economy and promote development in the country (OBG, 2008). Some have suggested that its purpose was to introduce Mr. Saif al-Islam Al-Gaddafi as the young leader, the reformist and the successor within the Libyan political establishment (Abouskeh, 2012).

Table 3.6 Libya's Ranking in the Global Competitiveness Report and the Corruption Perceptions Index

Global Competitiveness Report			Corruption Perceptions Index		
Year	**Rank**	**Out of Countries**	**Year**	**Rank**	**Out of Countries**
2005-06	110	111	**2006**	105	163
2006-07	NA	NA	**2007**	131	179
2007-08	88	131	**2008**	126	180
2008-09	91	134	**2009**	130	180
2009-10	88	133	**2010**	146	178
2010-11	100	134	**2011**	168	183

Note: the table provided Libyan rank in both reports GCR and CPI from 2006 to 2011. In both reports the highest rank is the worse in corruption and weakest in competitiveness.
The Sources: World Economic Forum website and the Transparency International website (OBG, 2008; TI, 2006, 2008, 2009, 2010a, 2010b, 2012; WEF, 2007, 2008, 2009, 2010)

3.7 Conclusion

This chapter has provided information about key aspects of the Libyan economic environment, which should help the reader to understand the Libyan context and supply some explanation for the research results. In addition to the brief outline of the geographical location and historical review of Libya, this chapter provides information about three further aspects of the country: (i) the education system, in particular, business education, and its impact on business practice; (ii) the political system and its influence on economic activities; and (iii) the economy before and after the discovery of oil, and its effect on development in Libya.

Business and individual behaviour can be influenced by the political and economic environment in many ways. Political or governmental stability can affect individual and business in a number of areas. In addition, governmental instability may lead to economic instability (Matook, 2009; Saleh, 2001). More importantly, changes in Government attitude towards business and the dependency of policy on the whim of one individual can make investment by companies difficult.

After about 60 years of independence, and approximately 50 years of exporting crude oil and despite the launch of many development plans, Libya remains a developing country. The State's failure to manage the resources and to create real development is as obvious as its failure to achieve diversity in sources of income. The oil and gas sector still represents the major contributor to Libyan GDP. In addition, various attempts at economic reform during the period from the early 1990s up to 2010 have been relatively unsuccessful; the Libyan economy still suffers from high rates of corruption (administrative and financial) and a lack of transparency.

Despite the high GDP per head of population, the geographical location and the large area within the country, economic development has been slow. The political authority of the country during the last four decades has not taken advantage of all opportunities to achieve the development goals it has set and improve the competitiveness of the Libyan economy, at least in the period from the mid-1990s to 2010. After the announcement of so-called economic and political reform, Libya is still one of the worst countries in terms of global competitiveness. The ineffectiveness of the Libyan economy is well documented. The deterioration of basic services, such as health, education and infrastructure, is another sign of the failure of the Libyan State to manage natural resources to establish real and

comprehensive development. The next chapter outlines the methodology and methods that will be used to address the research questions that emerge from this discussion of the Libyan context.

Chapter Four

Methodology and Methods

4.1 Introduction

This thesis aims to explore the capital investment appraisal process in Libyan firms by employing a number of research methods. In order to achieve this objective, a number of very important issues must first be discussed, namely: a clear determination of the research questions, an identification of the theoretical perspective adopted and an outlining of the appropriate research methodology and methods employed. Sekaran (2003) stated that the development of a theoretical framework involves the identification of the important factors relating to a particular investigation or study; building on a clear theoretical framework is crucial to the investigation of a research problem or question.

Moreover, the definitive relationship between the theoretical framework and the literature review can provide: (a) help in ensuring the development of a strong and appropriate theoretical platform; (b) assistance in identifying the factors which may be important to a research thesis; and (c) explanations of the relationships between these factors (Sekaran, 2003). Hence, it can be concluded that any research study must be underpinned by a relevant theoretical framework.

Design of any research involves a number of key phases starting with the process of identifying a research paradigm that can guide and inform the research procedure. The next phase involves the connecting of the selected paradigm to the empirical work through an appropriate methodology. The final phase is the selection of a research method to collect and analyse the requisite data (Denzin and Lincoln, 1994).

The main purpose of this chapter is to consider the paradigm which will direct the research methodology and choice of methods employed in an attempt to explore the research questions being considered.

The chapter is organised into five Sections. After the introduction, Section 4.2 reviews and discusses the philosophical assumptions as well as the theoretical framework employed in the study; in this section the focus is on Burrell and Morgan's (1979) framework for analysing paradigms within social science research. Section 4.3 is devoted to identifying the approach employed and locating the current work within the most appropriate research paradigm. The fourth section outlines the two research methods used to conduct the empirical work in this research. Finally, Section 4.5 concludes the chapter by summarising the previous discussions and highlighting links to the remainder of this thesis.

4.2 Theoretical Framework

The theoretical framework used in this study is grounded in the microeconomic foundations of finance theory; specifically, those relating to individual choices and utility maximisation. According to finance theory, the capital budgeting decision should maximise shareholders' wealth (Copeland et al., 2005). This perspective is employed as a framework to explore and interpret the capital investment appraisal process in Libyan companies. In particular, the theory will help address the following questions: (i) what capital investment appraisal techniques (if any) are used, and the role of non-financial factors in the decision about whether or not to proceed with an investment; (ii) whether risk is factored into any appraisal calculations; (iii) do Libyan firms face capital rationing and if so, is it externally or internally imposed?; and (iv) what sources of funding are available to Libyan firms when financing large capital expenditures?

Shareholders supply funds to companies in order to obtain a return on their capital which compensates for the delayed consumption involved as well as the risk

associated with their decision[62]. Companies earn this return by investing the funds provided in capital projects with future cash flows. According to Fisher (1930) and Heirshleifer (1958) the firm should keep accepting capital projects until the point where the IRR on the last investment equals the required return demanded by investors that is, where the NPV is equal to zero. At this point, investors can borrow or lend at the market rate of interest and achieve their desired consumption pattern which maximises their utility (Arnold, 2008).

Therefore, according to this theory, the value of the company is simply the total of the NPVs of the different projects, divisions, or any other investments within the company. This value-additivity principle implies that the NPV of a project is basically the contribution of any project to the firm's value (Ross et al., 2005). The theory suggests that NPVs translate directly into changes in equity value and so shareholders maximise wealth when all positive NPV projects are undertaken (Fisher, 1930; Heirshleifer, 1958). Theoretically, the capital investment decision-making rules suggest that managers should estimate the value created by a new project. This is achieved by using DCF methods (e.g NPV) and a firm's WACC (Gilbert, 2005).

The NPV is the present value of a project's future cash inflows minus the present value of its costs; it represents the project's contribution to shareholder wealth. The project with the largest NPV adds most value to shareholder wealth and thus increases the firm's share price. Managers are assumed to continue accepting

[62] This analysis by Fisher (1930) and Heirshleifer (1958) is based on a number of simplifying assumptions such as perfect knowledge, a borrowing rate which equals the lending rate and a two-period setting. Nevertheless, the analysis does show how the usage of DCF techniques such as NPV allows investors to maximise their utility. It also explains why the financial manager within the firm does not need to know the consumption requirements of all the different investors who invest in the firm; as long as the manager accepts all positive NPV projects, investors can "*borrow or lend on the capital market to produce the wealth distribution which meets their personal time pattern of consumption requirements*" (Pike and Neal, 2006)(p. 83).

projects with positive NPVs since these lead to higher share values[63]. Therefore NPV is considered as the single best appraisal method, mainly because it is directly linked to the firm's key objective which is the maximisation of the intrinsic value of a firm's share.

Well-managed companies spend a great deal of effort and time developing capital budgeting proposals. Finance theory states that the company should accept all independent projects with positive NPVs, and in case of mutually exclusive projects, the company should accept the project with the highest NPV. Nevertheless, in practice complications arise. First, it is hard to identify the appropriate discount rate to employ when appraising projects and, in contrast to the assumption of Fisher (1930) and Heirshleifer (1958), the borrowing rate is usually different from the lending rate. Second, individuals and companies rarely have complete knowledge of all possible projects and their cash flows; thus, companies sometimes set a limit on the capital available to invest in new projects - known in the literature as capital rationing (Brigham and Ehrhardt, 2011). Third, the original analysis of Fisher (1930) and Heirshleifer (1958) was initially based on a two-time-period model; in practice, most of the projects that textbooks discuss and firms consider last for several years. Nevertheless, despite these limitations, the analysis of Fisher (1930) and Heirshleifer (1958) is highlighted in the literature as the key theoretical underpinning for the usage of NPV criteria when evaluating capital budgeting decisions.

[63] This focus on NPV is slightly ironic since the original analysis by Fisher (1930) and Heirshleifer (1958) was couched in terms of IRR. Nevertheless, given the well-known problems associated with IRR (which were outlined in Chapter 2) the literature has tended to restate the analysis in terms of NPV rather than IRR.

4.2.1 Developed Conceptual Framework

The impact of historical, geographical and external environments on local contexts are important and should be considered when attempting to arrive at a better understanding of accounting practice (Miller and Napier, 1993; Carnegie and Napier, 2002). This is especially true of research into corporate financial management since various aspects of investment are influenced by these factors. Yet, when dealing with the issue of resource allocation (of which capital investment appraisal is a part) the focus of a great deal of academic research has been on an individual's choice where the simple aim is to increase this individual's wealth; this straight-forward analysis has then been extended to organisation or country level. Such an approach may give rise to problems because there is a growing need to understand the capital investment decision-maker's actions while recognising that firms have a political nature and operate within political environments and interact with their social as well as cultural contexts (Bower, 1970). Thus, additional factors need to be considered when examining topics such as capital investment appraisal such as political, cultural, religious and historical (post-colonial) influences on a company; an expanded conceptual framework is therefore required in order to facilitate a deeper interpretation of the findings and to understand the role of these contextual factors in the capital investment appraisal practice in Libyan firms.

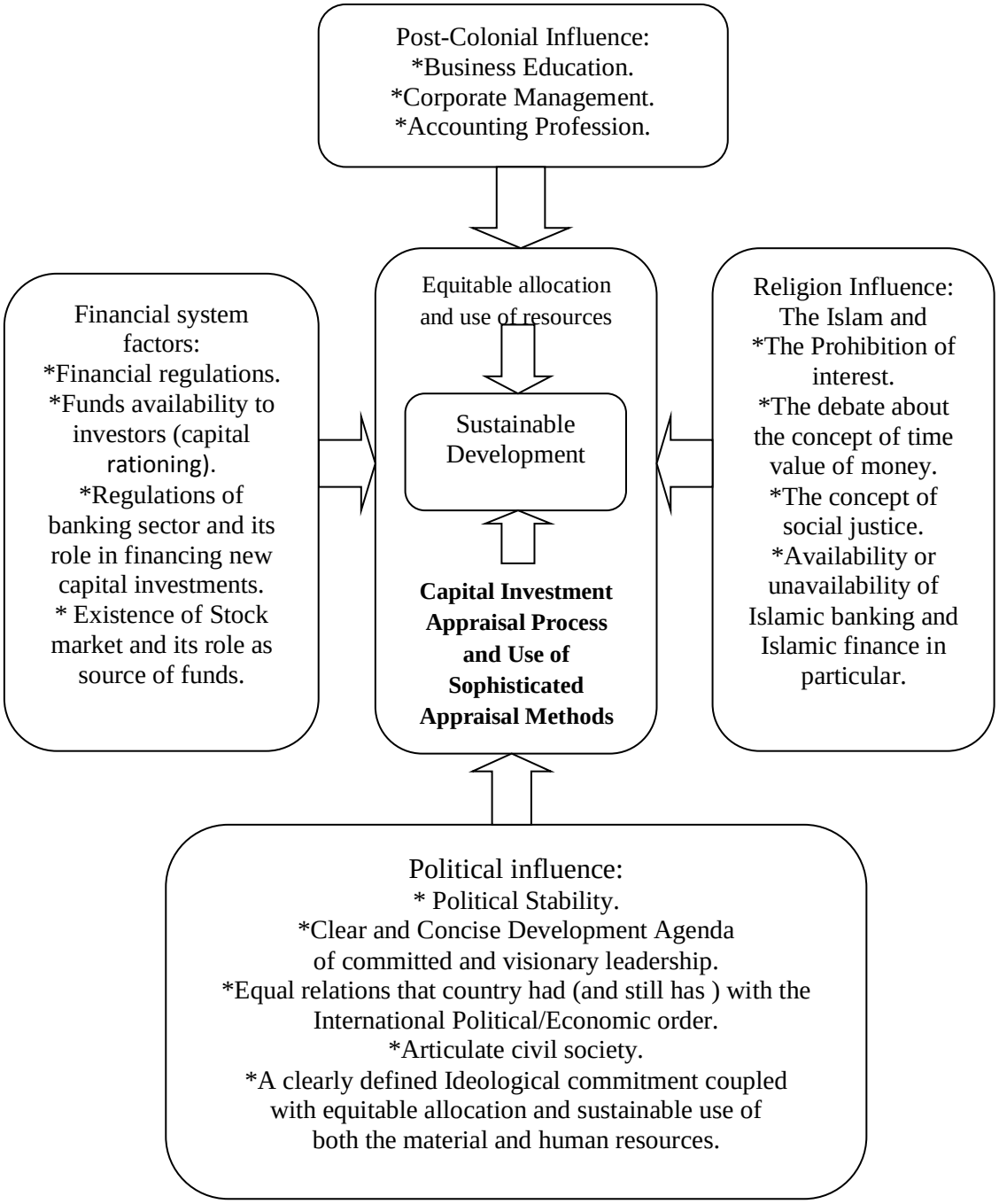
Figure 4.1 illustrates the four different factors which influence a firm's operations in general and the capital investment appraisal process in particular. These four factors are (i) the post-colonial[64] impact, (ii) religious and cultural influences, (iii) political

[64] Most developing countries, including Libya experienced colonialism by Western countries for decades before they gained their independence. In the case of Libya, the educational system and accounting profession were established under colonial rule and modelled (Buzied, 1998) on the structures as well as processes which existed within the coloniser's country (see Chapter 3). In practice, the accounting and auditing profession in Libya was modelled on their counterparts in the UK (Baker and Russell, 2003).

factors and (iv) the effects of the financial system. According to Figure 4.1, the first factor is related to the influence of the post-colonial power; for instance, the education system in general - business education in particular - initially drew on UK textbooks. Further, management processes and the accounting profession were modelled on structures that developed within the UK (see Chapter 3). Thus, it is not surprising that Libya's colonial past may have some role to play in explaining current investment appraisal practices within the country. The second factor relates to religious and cultural influences: the prohibition against interest in Islam, the absence of any time-value-of-money concept and the debate about the Islamic notion of social justice are all contextual factors that influence the wider business environment[65]. The third factor is political influence: this includes the political stability within a country, the presence of a clear and concise development agenda as set out by committed and visionary leaders, the relationship between a country and any international political/economic order as well as the equitable allocation and sustainable use of both material and human resources. This factor is especially important for Libya - Chapter 3 highlighted the various political changes that have occurred within the country. The contention of Figure 4.1 is that these political changes may have some role to play in explaining investment decisions by Libyan firms. The fourth factor is related to the country's financial system: it involves financial regulations, the availability of investor funding (capital rationing),

[65] The Islamic concept of economic activity does not simply relate to the elimination of Riba (interest); it embraces the Islamic notion of social justice (Lee and Detta, 2009). The relationship between banking / financial activities and religion within Islam suggested by Lee and Detta is illustrated in Figure 2.3 on page 48. There is widespread agreement among Muslims about the prohibition of Riba, although the time value of money concept is still a source of disagreement among Muslim scholars (Ahmad and Hassan, 2007). Some Muslim scholars believe that Riba's prohibition in Islam does not necessarily require the time value of money to be entirely ignored (Zarqa, 1983; Kahf, 1994), while other scholars see the time value of money notion as illegitimate under Shariah law (Khan, 1991; Vogel et al., 1998; Iqbal, 2002; Hearn et al., 2008).

Figure 4.1 Developed Conceptual Framework.



Source: developed from *Anyormi* (2007), (p.4).

regulation of the banking sector and its role in the financing new capital investments, the existence of a stock market and its role as a supplier of capital.

The implication of Figure 4.1 is that a broader theoretical framework is needed in order to interpret and understand the role of different factors within research such as that presented in this thesis. Otherwise, issues which are not covered by mainstream financial theory but are critical in practice might be overlooked and their influence on the capital investment appraisal process in Libyan companies ignored. New institutional theory and post-colonial theory[66] complement the main theoretical framework by providing further insights and a better understanding of the role of these factors in the capital investment appraisal process in Libyan companies.

In particular, New Institutional Sociology theory (NIS)[67] argues that intra-organisational structures, policies, procedures and practices play a key role in understanding the actions or decisions of individuals within society; in this thesis, capital investment appraisal processes in Libyan companies are assumed to be influenced by external factors. In this context, most of the theorists in the NIS area argue that, for example, the decision to ration funding among investments is not attributable solely to the motives of one individual within an organisation but may be due to the particular practices and/or structures of institutions within the country; there are external institutional factors that facilitate the adoption of certain practices and/or structures (Moll et al., 2006). The adoption of these practices and structures is seen as a source of organisational legitimacy. NIS theory argues that organisations

[66] This thesis draws on ideas from new institutional theory and post-colonial theory to strengthen the ideas advanced in Figure 4.1. However, these theories are not employed solely as the theoretical underpinning of the thesis.

[67] There are three branches of institutional theory, which are employed in a number of disciplines such as economics, sociology and politics (Scott, 2001; Moll et al., 2006). These branches are: (i) old institutional economics (OIE); (ii) new institutional economics (NIE); and (iii) new institutional sociology (NIS) (Burns and Scapens, 2000; Moll et al., 2006; Deegan and Unerman, 2006). Lately, institutional theory has been adopted by researchers to investigate issues such as accounting education and corporate governance (Khadaroo and Shaikh, 2007; Sudarsanam and Broadhurst, 2010). Even though, there are differences between these three sub-sets of institutional theory, they focus their concerns on institutional matters and institutionalisation process in organisations (Moll et al., 2006).

operate and exist within a network of rules, beliefs, policies, values, norms, cultural and social elements. All of these features need to be considered when explaining organisational decisions.

The different elements in Figure 4.1 work together to influence organisations to amend their practices (in this case, the capital investment appraisal processes in Libyan companies) and structures to conform with their external environments. These elements represent the external environment and its rules or requirements, which the organisation needs to comply with in order to sustain and legitimate itself when seeking access to resources and societal support; both are vital for the survival of the organisation, especially in a country such as Libya where a company's existence traditionally depended upon political patronage (see Chapter 3). Consequently, these organisations usually tend to adopt practices and structures, which are required by their social, political and cultural environment (Ribeiro and Scapens, 2006).

NIS theory offers a suitable framework for understanding the socio-economic, political and legal influences on an organisation at both the country level and the organisational level and the organisation's strategy for responding to these influences (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Oliver, 1991; Hussain and Hoque, 2002; Clemens and Douglas, 2005). NIS theory comprehends rules, regulations and norms at the societal level as defining what is *best* and *expected* in practice at the organisational level (Moll et al., 2006). DiMaggio and Powell (1983) argue that an organisation is subject to regulations and rules which correspond to their need for legitimacy. This pursuit of legitimacy helps explain why specific procedures and organisational forms are similarly practiced across

organisations that operate in similar environments, societies, sectors (Scott and Meyer, 1992) or fields (DiMaggio and Powell, 1983).

Scott (1995 and 2001) argues that NIS emphasises the importance of the broader social and cultural environment within which an organisation is rooted. In this regard, the organisational network is constructed through the putting-into-practice of laws, beliefs and values within various social relationships or networks.

There are two types of process for the adoption of similar practices or organisational forms: isomorphism or homogeneity (Mayer and Rowan, 1977; DiMaggio and Powell, 1983; Dillard et al., 2004). Isomorphism suggests that the organisation is driven to adopt a practice or procedure by a dominant concept of work within society. This process of adopting similar structures and practices (known as 'organisational imprinting' by Carpenter and Feroz (2001) or as an' institutionalisation process' by Carruthers (1995)), is driven by political and cultural factors concerned with legitimacy and power rather than efficiency (Mayer and Rowan, 1977). By contrast, two isomorphism mechanisms have been identified by DiMaggio and Powell (1983): (a) competitive isomorphism which is related to market pressures, and is based on the notion that competitive influences force an organisation to adopt the lowest, most-efficient practices and structures; (b) institutional isomorphism which is driven by competition for political and organisational legitimacy.

The second theory which helps in the development of the theoretical framework within Figure 4.1, and provides additional explanations and a better understanding of the impact of external factors on the process of capital investment appraisal in Libyan companies, is post-colonial theory. Steger and Carver (2009) see post-colonialism as:

> *"a discursive or theoretical standpoint that opposes Eurocentrism in all its forms, not just when deployed by a geographically demarcated West upon a non-West....A postcolonial perspective is an invaluable ally in the struggle against the hegemony of the idea of the market as the sole and best arbiter of decisions about the allocation of resources, the means to alleviate poverty, and the collective well being of the planet as a whole."* (p.4,5)

A colonial discourse, for the purpose of expansion and consolidation of power, was one of the reasons advanced for the continued domination of Third World nations even after some measure of self-determination had been achieved (Echtner and Prasad, 2003). Post-colonial theory argues that this discourse still dominates previously colonised nations by "soft power", or a mind-based level of control rather than a physical or legalistic form of colonialism (Gandhi, 1998).

Post-colonial theory refers to the situation which arises after colonialism. Thus, post-colonial theory explains colonialism's legacies for colonised nations, particularly in the Third World. Post-colonial theory covers most aspects of life that might be influenced by the colonial experience; for example, migration, resistance, representation, difference, and responses to the influential discourses of imperial Europe on such things as history, philosophy and linguistics. In addition, it covers political and economic matters (Gandhi, 1998; Ashcroft et al., 2003). Post-colonial theory assumes that understanding the status quo comes about through an examination of the historical experience associated with colonialism (Sugirtharajah, 2004).

The post-colonialism impact and the influence of globalisation on accounting and business education, as well as on the profession questions the roles of accounting in a local context. The professional accountancy bodies that emerged from a period of colonialism usually worked to serve the interests of the coloniser. In this thesis,

Libyan accounting education and the accounting profession are seen essentially as Western artefacts according to post-colonial theory; for example, in the absence of local accounting standards, international standards are used thereby continuing the domination of the former colony by a developed-country elite. Further, the accounting curriculum in business schools does not take the local context and the local culture into account. For example, in Libya, business organisations initially depended on foreign accounting bodies from Italy and the UK; local bodies only appeared after independence in 1951 but these were simply Libyan re-incarnations of the former firms (Ahmad and Gao, 2004).

Accounting education in Libya is influenced by the education systems in the US and UK (Zubek, 2008). One reason for this influence is that a majority of the staff members in accounting departments at Libyan Universities are either foreigners or educated in the UK, the US, or both (Ahmad and Gao, 2004). As with other countries that have experienced colonialism, the accounting system in Libya is influenced by its Western counterpart; therefore, it did not emerge from the local context in Libya (Samuels and Oliga, 1982). Accounting education in Libya was established during the monarchy, when Libya was in the process of adopting a capitalist economic system. Because of Western influences on accounting education, the accounting profession had a capitalistic orientation. The accounting curriculum, at Libyan Universities used text books based on the UK educational system between 1957 and 1976; the system then adopted a US focus as American textbooks started to be employed (Baker and Russell, 2003). Bakar (1997) argues the Western accounting has influenced Libyan accounting education and the accounting

profession; and both have affected Libyan's economic development[68]. Both of these US and UK styled educational systems have replicated the Anglo-American version of capitalism (Collison et al., 2010) especially now that the socialist ideology of the previous Al-Gaddafi regime has been repudiated[69]. Libya is not alone in this regard; Wijewardena and Yapa (1998) argued that most developing nations which were under UK occupation adopted the British accounting educational system (Tikly, 2001).

4.3 Philosophical Assumptions

4.3.1 Philosophical Approach to Social Science Research

Walliman (2006) defined research as the systematic investigation with all available resources for the purpose of establishing new facts or providing new insights. Collis and Hussey (2009) expanded upon this definition by describing research as a process of investigation to find out the reality about some underlying phenomenon. Research is a term widely applied to refer to a variety of activities, such as collecting data, examining theories and creating new facts and/or conclusions. In the social sciences, research, as a term, describes an investigation of human behaviour in an attempt to understand people's actions and decisions (Walliman, 2006). Even though Collis and Hussey (2009) state that research is a central process in testing theories and explaining practical activities, there are

[68] It is worth mentioning that colonialism has had a significant impact on the educational system in Libya; in particular, many schools were set up while Libya was under the British Mandate (Kilani, 1988; Bakar, 1997) (see Chapter 3).

[69] Of course, the education system and accounting profession went through changes as the political system with Libya moved from a western-supported to Monarchy to a socialist regime and back to a mixed-economy approach.

various points of view about the definition of research within the literature. Specifically, Collis and Hussey (2009) noted that:

> "*research means different things to different people*" (p.1).

Saunders et al. (2009) provide a general definition of research:

> "*Something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge [about the phenomenon under study]*." (p.5)

There are two points that emerge from this definition; the first is the 'systematic way' in which research should be conducted so that it includes an explanation of the methods and instruments used, in order to give reasonable meaning to any results arrived at. The second point is that research aims " to find out things", which means that the research should seek to answer a question(s), as well as provide some understanding after analysing, criticising and/or explaining the issue in question; taken together, this reasoning would suggest that research is a logical process and not based on subjective personal beliefs (Ghauri and Gronhaug, 2005).

Research in the business world is usually considered as a part of social science because it deals with human beings or organisations run by individuals where actions, decisions and outcomes prove difficult to predict with certainty. Within the social sciences, the researcher's philosophy and paradigm are usually viewed as having a significant role to play. Moreover, the researcher's point of view and understanding of the development of knowledge in social science deeply influences the whole process of conducting a research project (Nwokah et al., 2009).

Regarding research philosophy and its importance in research, Easterby-Smith et al. (2002) highlight reasons why it is useful to understand philosophical assumptions about the world made by those undertaking the investigation. First, the

understanding of philosophical assumptions can help the researcher in clarifying matters regarding research design; for instance, it aids in the identification of the type of data required, the type of information to be gathered and how knowledge can be interpreted. Second, philosophical assumptions can also assist the researcher in identifying the 'appropriate' sources of knowledge and 'relevant' research instruments to accomplish the objectives of the investigation being undertaken. Third, an understanding of research philosophy can assist researchers in the production and/or classification of research designs, which may be new in a specific field of knowledge.

Burrell and Morgan (1979) stated that the researcher's approach to how the social world may be investigated and/or the researcher' general understanding of the world is 'either implicitly and/or explicitly' influenced by a number of philosophical assumptions; these act as foundations for social science research.

According to Burrell and Morgan (1979), social theory is based upon two main sets of assumptions regarding the nature of social science and two main assumptions about the nature of society; thus they characterised social science research according to four key paradigms. The fundamental sets of philosophical assumptions about society depend on the researcher's views of ontology, epistemology, human nature and methodology: the resultant positioning supports different approaches to social science research (Burrell and Morgan, 1979).

According to Collis and Hussey (2009), the fundamental notion of the objectivist approach is a belief that social reality and social phenomena are independent of human beings and exist regardless of whether or not we are aware of them. Consequently, the action of studying reality does not have an influence on the reality itself. Easterby-Smith et al. (2002) argued that the objectivist approach in social

science research assumes that the social world exists externally, where its features can be measured by the objective scientific techniques typically used in the natural sciences, for example physics and chemistry, instead of being inferred subjectively based on reflection, inspiration or sensation.

By contrast, the subjective approach is based on the assumption that the world is a social construct and cannot exist independently of the individual. Social reality and social phenomena are determined by the actions and perceptions of social players (Easterby-Smith et al., 2002); and only exist within the minds of human beings. Thus, the process of conducting research affects reality. The subjectivist approach emphasises meaning and is concerned with understanding human behaviour involved in the social phenomenon from the participant's own frame of reference (Collis and Hussey, 2009). Easterby-Smith et al. (2002) clarified this idea by suggesting that the subjectivist approach concentrates on what social players individually and/or collectively are thinking and feeling about the social phenomenon under investigation. For example, Easterby-Smith et al. (2002) illustrated this point by arguing that a subjectivist approach, a researcher may try to explore why individuals have different experiences or opinions rather than attempt to search for external reasons and/or essential laws that explain human behaviour. Bryman and Bell (2007) argued that the main difference between these two research approaches or philosophies relates to the question of whether entities can be considered as social constructions built up from the opinions and acts of social players or whether they should be considered as objective entities having a reality external to individuals.

Figure 4.1 illustrates the assumptions grouped according to the two ends of the 'subjective and objective' continuum, that constitutes the nature of social science in Burrell and Morgan's typology.

Figure 4.2
The Two Dimensions of Social Science Theory.

The subjectivist approach to social science		**The objectivist approach to social science**
Nominalism	← **Ontology** →	Realism
Anti-positivism	← **Epistemology** →	Positivism
Voluntarism	← **Human nature** →	Determinism
Ideographic	← **Methodology** →	Nomothetic

Source: Burrell and Morgan (1979, p. 3)

4.3.2 Ontology

Ontology refers to the philosophy behind the reality of existence (being); in other words, the ontology assumption refers to the kernel of the phenomena being investigated (Burrell and Morgan, 1979; Chua, 1986; Healy and Perry, 2000; Bryman, 2004; Blaikie, 2007; Senik, 2009). Hence, social science researchers have to decide on basic ontological questions before advancing their research to the empirical stage. In the literature, ontological thought is typically divided into two groups based on whether the researcher adopts an objectivist or subjectivist approach. Burrell and Morgan (1979) described the two approaches to ontological thought as follows:

> *"The nominalist position revolves around the assumption that the social world external to individual cognition is made up of nothing more than names, concepts and labels which are used to structure reality…… ……..Realism, on the other hand, postulates that the social world external to individual cognition is a real world made up of hard, tangible and relatively immutable structures."* (p.4).

The objectivist approach assumes that the social world is real and made of tangible and solid facts with a relatively constant structure (realism). At the other end of the continuum, the subjectivist approach presumes that the social world is abstract and spiritual (nominalism). Nominalism believes that the social world is generated by human consciousness and the names, concepts and labels created by human beings to understand and communicate the notions of the social world to others [70] (Burrell and Morgan, 1979; Morgan, 1988; Kolakowski, 1993). Reality is considered as objective, and independent of the researcher at the realism end of the continuum whereas with nominalism it depends on who observes the phenomenon, the things being investigated and other participants in the research process (Lincoln and Guba, 1985). Figure 4.2 shows the six levels of ontological thought, based on Morgan and Smircich's (1980) classification. The positivist (objectivist) and phenomenologist (subjectivist) assessments are two extreme opinions. Collis and Hussey (2009) argued that there are several different positions that a researcher can adopt in between these two extremes highlighting the fact that a continuum of views exist about the nature of reality, depending upon a researcher's ontological position.

In this formulation, level 1 represents an extreme objectivist (positivism) view of the world, whilst level 6 reflects an extreme subjectivist (phenomenologism) position. Assumptions about the tangibility of the social world become weaker as the researcher's perspective moves from level 1 to level 6.

[70] Furthermore, 'in its most extreme form nominalism does not recognise the existence of any world outside the realm of individual consciousness' (Kolakowski, 1972) (p.158).

Figure 4.3

Morgan and Smircich's Pattern of Fundamental Ontological Assumptions

	Level	Assumption
Positivism (Objectivism)	1	Reality as a concrete structure.
↑	2	Reality as a concrete process.
Pattern of Fundamental Ontological Assumptions	3	Reality as a contextual field of information.
	4	Reality as symbolic discourse.
	5	Reality as social construction.
↓		
Phenomenologism (Subjectivism)	6	Reality as a projection of human imagination.

Note: adapted from Morgan and Smircich (1980).

The nature of the reality (phenomena) being investigated and the perspective focused on by the researcher allows for the possibility of different world views to exist. According to Collis and Hussey (2009) what is important is that the researcher is aware of their own assumptions about reality and their position within Morgan and Smircich's schema. However, criticism of Morgan and Smircich's schema exists. For instance, Lye et al. (2006) argued that it is inappropriate to describe the subjective and objective dimensions of reality in terms of a continuum as no point of view is purely subjective or objective. The optimal approach is therefore to investigate all aspects of the research phenomena, but this is hardly practical for a single-researcher project with limited resources and time. This is one reason why a clarification of a researcher's chosen perspective is one of the key elements needed in order to introduce and justify a selected research methodology.

4.3.3 Epistemology

Burrell and Morgan (1979) identified epistemology [71] as:

> *"Assumptions about the grounds of knowledge about how one might begin to understand about the world and communicate this as knowledge to fellow human beings; entail idea, for example, about what forms of knowledge can be obtained and how one can sort out what is to be regarded as true from what is to be regarded as false"* (p.1).

Epistemology relates to the philosophy of knowledge[72]. It addresses various questions such as - how do researchers know the world? - what forms of knowledge can be obtained? - how can truth be distinguished from untruth? - can knowledge be acquired or is it experienced? – what do researchers mean when they state that they 'know' something? (Burrell and Morgan, 1979; Hopper and Powell, 1985; Guba and Lincoln, 1994; Creswell, 1997). Epistemology specifies how to gain knowledge about a subject under investigation. For example, Chua (1986) argued hat: 'Epistemological assumptions decide what is to count as acceptable truth by specifying the criteria and process of assessing truth claims' (p.604).

Burrell and Morgan (1979) recognised two extreme understandings of epistemology, which are associated with assumptions regarding the nature of knowledge and how researchers within the social sciences understand the world that they are investigating. A positivist epistemology argues that knowledge exists freely

[71] Cooper et al. (1999) explained epistemology as a section of philosophy whose purposes are: first, understanding such concepts as memory, belief, justification, evidence, certainty, doubt and knowledge; and second, enquiring into the criteria for the application of such terms, in particular, the criteria for identifying *"the scope and limits"* of human knowledge. Cooper et al. said that:

> *"Many people have the impression that epistemology is the most central area of philosophy, or even that philosophy should really be identified with epistemology. Certainly there is a popular image of philosophers as people obsessively and almost solely concerned with determining whether we really know the things we ordinarily think we do" (p.3).*

[72] Crotty (1998) provided a clear definition of epistemology as "the theory of knowledge embedded in the theoretical perspective and thereby in the methodology"(p.3). Moreover, it is a way of understanding and explaining knowledge of humanity (Crotty, 1998).

of any awareness; it can be built merely on empirical observation. Researchers seek to clarify and forecast what happens in the social world by seeking out regularities and causal relationships between its component elements (Godfrey et al., 2000). Gill and Johnson (1997) linked positivist epistemology to methods based on the traditional approaches which dominate scientific research. On the other hand, anti-positivism argues that the researcher can only understand the social world from the standpoint of those individuals directly involved in the activities under investigation; they rejected the view that knowledge exists objectively in favour of the alternative which argues that knowledge is personal (Hopper and Powell, 1985; Crotty, 1998).

4.3.4 Human Nature

Ontological and epistemological assumptions about the social world shape the researcher's viewpoint on human nature and the relationships between individuals and their environments. Assumptions about human nature concern issues such as whether human behaviour is decided by the environment (Determinism) or according to the will of individuals (Voluntarism) (Burrell and Morgan, 1979). The issue of human nature concerns whether the topic under investigation is a matter of interpretation, or whether rules and axioms exist that constrain individuals. Therefore, human activities happen either with the free will of individuals, or as a result of deterministic factors which operate externally (Burrell and Morgan, 1979; Chua, 1986).

4.3.5 Methodology

Methodology is the fourth key issue relating to how researchers obtain knowledge about the social world. Conventional reasoning suggests that the methodology

employed by researchers will be shaped by their understanding of ontology, epistemology and human nature (Burrell and Morgan, 1979). Strauss and Corbin (1998) described methodology as *"a way of thinking about and studying social reality."*(p.3). In other words, methodology involves the simple assumptions and fundamental philosophy that a researcher uses in order to answer the questions being investigated (Gioia and Pitre, 1990; Creswell, 1994).

An ideographic methodology adopts a subjective approach which seeks knowledge from personal experiences. It focuses on getting inside the minds of research subjects and exploring their background in detail; therefore, it necessitates an involvement with an individual's everyday life, observations and very detailed information. On the other hand, the nomothetic approach to methodology proposes that the social world is similar to the physical environment in having certain rules (Burrell and Morgan, 1979) and is best studied by observing outcomes using scientific methods; hypotheses are investigated mostly using quantitative methods and standardised research instruments (Chua, 1986). Assumptions about methodology influence the research procedure. Indeed, Collis and Hussey (2009) explained methodology as the inclusive approach to the whole research process from theoretical foundation to the collection and analysis of data. Similarly, Crotty (1998) defined methodology as:

> *"the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes."* (p.3)

Therefore, Methodology is a research plan that guides the choice of instruments and procedures for collecting and analysing data relating to particular investigations (Crotty, 1998).

4.3.6 Social Structure

Besides assumptions about the nature of social science, Burrell and Morgan (1979) also outlined assumptions about the structure of society. They described two different ends of a spectrum: the first is the Sociology of Radical Change, and the second is the Sociology of Regulation.[73] Figure 4.3 highlights the extreme perspectives of these two views about how society operates indicating the basic dissimilarities between them. The seven points shown in Figure 4.3 reflect a range of opinions and interpretations about the nature of society. These two dimensions – the sociology of regulation and of radical change - represent the concepts of order and conflict in the social world.

Figure 4.4 The Regulation-Radical Change Dimension

The Sociology of REGULATION is concerned with:	**The Sociology of RADICAL CHANGE is concerned with:**
(a) The Status quo	(a) Radical change
(b) Social Order	(b) Structural Conflict
(c) Consensus	(c) Modes of Domination
(d) Social Integration and Cohesion	(d) Contradiction
(e) Solidarity	(e) Emancipation
(f) Need Satisfaction	(f) Deprivation
(g) Actuality	(g) Potentiality

Source: Burrell and Morgan (1979)

[73] Dahrendorf (1959) illustrated two types of approaches to social science. On the one hand, an approach to sociology that focuses on explanations of the nature of social order and social structure equilibrium and, on the other hand, approaches concentrating more on change and its problems, as well as coercion and conflict in the social world. The differences between these approaches were referred to as the 'order-conflict' debate. The order view of society highlights integration, stability, consensus and functional co-ordination, which are fundamentally concerned with sustaining the models of the whole system. The conflict opinion of society underlines change, disintegration, conflict and coercion.

Burrell and Morgan (1979) argued that the term ‘sociology of regulation' refers to theories that explore society's unity and cohesiveness. The term ‘radical change’ stands in contrast to ‘the sociology of regulation’ – the related theories emphasise structural conflict, modes of domination and structural contradiction. The basic questions for ‘the sociology of regulation’ are focussed on why society is maintained as an entity and why does it tend to hold together rather than fall apart? While from the ‘sociology of radical change’ perspective, the basic questions focus upon the deprivation of man, both at a psychological and material level; this viewpoint is often concerned with ‘what is possible rather than with what is; with alternatives rather than with acceptance of the status quo’ (Burrell and Morgan, 1979) (p.17).

4.3.7 Paradigms

According to Burrell and Morgan (1979), both the subjective-objective and regulation-radical change dimensions when brought together, reveal the nature of science. According to this model, the researcher can view the world from one of four paradigms: radical change, radical structuralist, interpretive and functionalist.

Figure 4.5 Four Paradigms for the Analysis of Social Change

The Sociology of Radical Change

Subjective		Objective
	Radical Humanist | *Radical Structuralist*	
	Interpretive | *Functionalist*	

The Sociology of Regulation

The Source: Burrell and Morgan (1979)

Figure 4.4 illustrates the connections between these four paradigms.[74] Each paradigm shares a common group of features with its neighbour on both axes: horizontally and vertically. Each set describes a distinct social-scientific reality. Figure 4.4 illustrates the 'four-paradigm' model of Burrell and Morgan. This schematic is intended to work as a map and help researchers to establish their current positions, where they have been and where they will maybe go in the future. Consequently, one's position in a particular paradigm suggests that a researcher sees the world in a particular way, because the four paradigms present four different views that each depend on particular philosophical assumptions. These paradigms are mutually exclusive[75], which means that the researcher can only be located in one 'paradigm' at any point of time. Thus, when accepting the assumptions of one

[74] The word paradigm is not easy to define and has been used in multiple ways (Kuhn, 1970). However, the present using of the expression of paradigm in scientific development is set by Kuhn (1970). The term paradigm, in its most common interpretation, refers to a basic set of beliefs that guide action in research or inquiry (Guba and Lincoln, 1994; Crotty, 1998; Guba and Lincoln, 2000). A scientific paradigm can be described as a comprehensive approach to thinking that organises scientific efforts; it is a lens 'tool' through which the researcher views the world. According to Guba and Lincoln (1994), a scientific paradigm is a way in which we understand the world. Keat and Urry (1975) argued that scientific problems are considered as puzzles, these problems which are known to have a solutions within the framework of assumptions implicitly or explicitly embodied in the paradigm. If a puzzle is not solved, the fault lies within the scientist and not in the paradigm. Past and currently emerging paradigms are often characterised by the way their supporters react with ontological, epistemological and methodological questions (Guba, 1990; Guba and Lincoln, 1994) and to research-related issues, for instance objectives of research, values of researchers, representation and goodness or criteria of quality (Guba and Lincoln, 2000). Kuhn (1970) described a paradigm as a "unitary package of beliefs about science and scientific knowledge...an overarching conceptual construct, a particular way in which scientists make sense of the world or some segment of the world" (p. 35). Burrell and Morgan (1979) employed a comprehensive understanding for the term paradigm than Kuhn (1970). Burrell and Morgan (1979) concluded that:

> *'social theory can be conveniently understood in terms of the co-existence of four distinct and rival paradigms defined by very basic meta-theoretical assumptions in relation to the nature of science and society'*(p.36).

Therefore, 'paradigms', 'problematics', 'alternative realities', 'frames of reference', 'forms of life' and 'universe of discourse' are 'related conceptualisations although of course they are not synonymous' (p. 36).

[75] However, Chua (1986) argues that there is no rational ground for the assumption made by Burrell and Morgan (1979) that these paradigms are separate and distinctive from each other. Therefore, Chua (1986) established the alternative philosophical classification of research into mainstream accounting research, interpretative research and critical theory. The assumptions for this alternative classification were based on three sets of beliefs: (1) beliefs about knowledge; (2) beliefs about physical and social reality; and (3) beliefs concerning the relationship between theory and practice. Laughlin (1995) rejected the subjective-objective dimension, producing instead a three-dimensional framework that categorised theory, methodology and change. He distinguished three levels: high, medium and low.

paradigm the assumptions of other paradigms are rejected. Hussey and Hussey (1997) suggested that the various paradigmatic positions of a researcher are now often considered as "positivism"[76] and "phenomenology", consistent with Burrell and Morgan's functionalist and interpretive paradigms [77]. More common terms that are used to describe these research approaches include "quantitative" and "qualitative" research (McCluskey, 2005).

Both paradigms located in the upper half of Figure 4.4, the radical humanist and radical structuralist paradigms, are underpinned by the sociology of radical change and are linked with attempts to shift the existing status quo within society.

According to Burrell and Morgan, radical humanism is where the consciousness of humans is dominated by the ideological superstructures within which they interact, and these drive a cognitive wedge between themselves and their true consciousness, preventing human fulfillment. Most of this paradigm is anti-organisation, and is intended to study phenomena from a subjective perspective. Here, Burrell and Morgan (1979) stated that:

> *"the radical humanist views the social world from a perspective which tends to be nominalist, anti-positivist, voluntarist, and ideographic"*(p. 32).

In contrast, the radical structuralist paradigm assumes that radical change is built into the nature of social structures. Modern societies are characterised by essential conflicts which create radical change through economic and political crises. The radical structuralist paradigm supports a radical change approach to social order, but

[76] Positivism searches for a solution for the most important practical problems, roles or laws, which can be generalised, and emphasises statistical analysis to discover precise causal relationships (Candy, 1991; Crotty, 1998; Kim, 2003). This paradigm uses research methods to describe, predict and control human behaviour. Positivists contend that research should be bias-free, value-free, context-free and replicable (Plack, 2005).

[77] The phenomenological paradigm is qualitative, subjectivist, humanistic and interpretive, while the positivistic paradigm, is quantitative, objectivist, scientific, experimentalist and traditionalist (Burrell and Morgan, 1979).

based on an objective ontological and epistemological perspective; this paradigm is committed to radical change, emancipation and potentiality. The radical structuralist paradigm approaches these general concerns from a realist, positivist, determinist and nomothetic perspective (Burrell and Morgan, 1979).

Burrell and Morgan (1979) stated that the functionalist paradigm[78] is firmly rooted in the sociology of regulation and approaches its subject matter from an objectivist point of view; it therefore uses an approach which is realistic, positivist, determinist and nomothetic. The functionalist paradigm is the foremost paradigm for a structured study. It aims to provide rational explanations of human affairs and is pragmatic and deeply rooted in sociological positivism. Relationships are seen as concrete and can be identified, studied and measured using scientific tools. Burrell and Morgan (1979) argued that the functionalist paradigm provides explanations of the status quo, social order, consensus, social integration, solidarity, satisfaction and actuality.

By contrast, the interpretive paradigm reflects the sociology of regulation but takes a subjective approach to social science enquiry. Ardalan (2008) described it as:

> *"The interpretive paradigm assumes that social reality is the result of the subjective interpretations of individuals. It sees the social world as a process which is created by individuals. Social reality, insofar as it exists outside the consciousness of any individual, is regarded as being a network of assumptions and intersubjectively shared meanings. Tins assumption leads to the belief there are shared multiple realities which are sustained and changed. Researchers recognize their role within the phenomenon under investigation. Their frame of reference is one of participant, as opposed to observer. The goal of the interpretive researchers is to find the orders that prevail within the phenomenon under consideration; however, they are not objective."*(p.5-6)

[78] The functionalist paradigm views society as a distinct system of interrelated components, each of which has a specific function. The objective of research is to discover the nature of those functions. Chua (1986) used the similar classification of mainstream accounting research, which starts from an objective interpretation of society, concerns individual behaviour as deterministic, uses empirical observation and a positive research methodology (Ryan et al., 2002). While in Chua's (1986) analysis, theory and observation are independent of each other. Further, empirical reality is objective and external to the subject.

This paradigm is most interested in understanding the subjectively created world "as it is" in terms of viewing society as an ongoing process. It seeks to explain the stability of behaviour from the individual's viewpoint, emphasising the spiritual nature of the world and using an approach which is nominalist, anti-positivist, voluntarist and ideographic.

At a very basic level, the argument about research methods can be summarised as a choice between quantitative and qualitative methods. The quantitative approach is associated with a positivist standpoint and usually uses methods such as questionnaires or time-series data, mathematical modelling and graphs. In contrast, qualitative research employs the development of notions, understanding and insights through critical assessment. However, these research approaches are not mutually exclusive, but can be viewed as two extremes in the choices to be made (Chua, 1986; Patton, 1990; Laughlin, 1995).

4.4 Research Paradigm and Objectives

In the context of Burrell and Morgan's (1979) framework, the researcher is required to adopt an approach/paradigm whilst seeking knowledge. The present study is primarily based on qualitative research, with a subjectivist orientation but a main concern in the area of the sociology of regulation. The interpretive paradigm is therefore employed throughout. In particular, this research is located at a point in the interpretive paradigm spectrum that is close to the middle line separating the interpretive from the functionalist paradigm. The sociology of radical change is not appropriate for a study of the Libyan economic environment where centralised

planning and control are deeply embedded[79]. Furthermore, rather than simply describing the phenomena which are under investigation, the aim of this research is to understand and interpret the issues surrounding the problem being considered. Thus, the research aims to better understand the nature of the capital investment appraisal process in Libyan companies as it was at the time of analysis, and how it might differ across Libyan economic sectors. It is essential that the researcher provides evidence to support the findings arrived at and to contribute to the debate about this important issue; this is achieved by using research methods which are compatible with the interpretive paradigm and consistent with the methodology and the researcher's beliefs about the subject under discussion. In short, according to Chua (1986):

> *"What is a correct research method will depend on how truth is defined"*(p.604);

while Mingers (2001) developed this reasoning when he noted that:

> *"Research methods can be seen as instruments for provoking a response from the world...Different methods generate information about different aspects of the world"* (p.242-43).

The researcher is aware of the benefits of employing a number of different methods in order to help develop the argument being advanced by providing more detail, insights and ways of seeing the research phenomena or the problem; if different research instruments are used, the results obtained will be more reliable. In contrast, when research depends only on one research instrument to obtain findings about the phenomena under investigation, results may be limited (Mingers, 2001).

[79] This was especially true at the time when the research was undertaken. While subsequent changes within Libya - especially the demise of the Al-Gaddafi regime might suggest that a more "radical change" agenda might be appropriate, these changes took place after the empirical component of the research work was completed. See Chapter Three for more detail about the Libyan economic environment.

The research methods employed in this thesis are: (i) semi-structured interviews; and (ii) a questionnaire survey based on the literature review and on the key results from (i). The literature review is considered a part of the research method here since it helps to develop new insights regarding our current state of knowledge about investment decision-making, particularly in the developing world. This combination of research methods is used to answer the following research questions:

First, how do Libyan firms appraise capital investment? In particular: are any formal capital Investment Appraisal Techniques (IATs) used?; How important are these IATs?; Do non-financial criteria play a more important role than financial criteria in investment appraisal decisions?; What is the source of investment ideas and how many stages can the process be broken into?; Are real options considered and are different criteria employed for AMT?; Do any of the project features play a role in the choice of IATs employed?

Second, this research examines whether or not Libyan firms incorporate risk into the capital investment appraisal process. Specially, it investigates how Libyan firms incorporate risk into their capital budgeting decisions, whether they calculate a specific cost of capital and what discount rate if any, is employed?

Third, the empirics investigate whether Libyan firms face capital rationing, and if they do, whether it is externally or internally imposed. As part of this question, the thesis investigates views on the frequency with which capital rationing occurs, the main reasons for any capital rationing and the role of the LSM as a source of finance, which might alleviate any shortage of funding.

Fourth, this thesis examines whether the availability of Islamic Finance (IF) affects Libyan firms' view of the capital investment appraisal process. Specifically, it investigates whether Libyan firms use Islamic Financial products and seeks opinions

on why some Libyan firms favour IF and others do not. Views are also sought about whether the use of IF has any effect on capital investment appraisal practices.

As stated previously, this research is mainly a qualitative and exploratory study; it does not set up detailed hypotheses for further investigation. Its main aim is instead to provide a descriptive explanation of a very poorly-understood phenomena, i.e. the capital investment appraisal process in a complex environment such as pre-revolution Libya. Therefore, the philosophical methodological assumptions of this study are orientated toward implementing the ideographic methodology of social science, based on the view that the researcher can only understand the social world by obtaining direct knowledge of the subject under study from participants in the process.

4.5 Research Methods

In the literature, an argument exists about whether a researcher should start with interviews or questionnaires or whether both should be undertaken at the same time. For instance, both methods (interviews and questionnaires) should be conducted at the same time according to Arnon and Reichel (2009). However, Moscovici (2008) argued in favour of conducting the questionnaire first when it is used in combination with interviews. He justified this approach by suggesting that any ambiguous result from a questionnaire can then be discussed in detail with interviewees to see why a particular finding might have arisen. In contrast, Jarratt (1996) argued that when interviews and questionnaires are employed, the interviews should be conducted first so that its findings can be used to frame a subsequent questionnaire; this is especially appropriate where there is a dearth of evidence about the research issues being examined, as is the case in this study. The researcher here therefore favoured

conducting the interviews first in order to obtain a deeper insight and a more detailed understanding of the process of capital investment appraisal within Libyan firms; it was hoped that the interview findings would be used to help design and define the structure of a questionnaire which would be distributed to a large-scale sample at a later stage.

4.5.1 Semi-Structured Interviews

Based on the comprehensive insights, information and experiences gained from reviewing previous studies on this research topic, an initial attempt at designing a semi-structured interview document took place first (Oppenheim, 1992). The researcher commenced with a prepared set of questions that were drawn from the literature and which would underpin the semi-structured interviews. The semi-structured interview process can be described as follows:

> *"The researcher has a list of questions on fairly specific topics to be covered, often referred to as an interview guide, but the interviewee has a great deal of leeway in how to reply. Questions may not follow on exactly in the way outlined on the schedule. Questions that are not included in the guide may be asked as the interviewer picks up on things said by interviewees. But, by and large, all of the questions will be asked and a similar wording will be used from interviewee to interviewee."* (Bryman and Bell, 2007) (p.474).

Suler (2010) believed that the use of interviews provides *"in-depth information about a particular research issue or question"*(p.1). Ahrens and Chapman (2006) likewise stated that an interview:

> *"might be seen as an ongoing exchange in which the researcher actively works to understand"*(p.822).

In addition, according to Ely et al. (1991), when using an interpretive approach, interviews are appropriate since the researcher will *"want those who are studied to speak for themselves, to provide their perspectives in words and other actions"*(p.4).

To prepare for the semi-structured interviews[80], 19 questions were identified from an analysis of the literature. Separate versions of these questions were developed for two groups of interviewees: the first being interviewees working within companies and the second being interviewees employed outside firms (bankers, academicians and chartered accountants), but likely to be knowledgeable about investment appraisal issues; in order to obtain different opinions, interviewees from both inside and outside Libyan companies were targeted. In both versions of the interview document, the questions were grouped into seven sections, namely: background information, the investment context, appraisal techniques, risk, decision-making and control procedures, capital rationing and real options, as well as investing in AMT. These seven sections were designed to obtain sufficient information in order to provide adequate answers to the research questions being investigated.

[80] In order to prepare the interview, the previous literature was examined closely especially previous studies in the area which employed interviews to investigate the capital investment process, such as: Pinches (1982), Ross (1986), Jones and Dugdale (1994), Mukherjee and Hingorani (1999), Akalu (2003), Gilbert (2005), and Khamees et al. (2010).

The following table shows these sections and their links to the research questions:

Table 4.1 The Link between the Interview Questions and Research the Questions

Interview sections	**Main Research questions**
A and B	Background information and Investment Context
C : Q1 to Q4 E : Q7 to Q10 G : Q15 to Q18	**RQ1**: How do Libyan firms appraise capital investment?
D : Q5 to Q6	**RQ2**: How do Libyan firms incorporate risk into the capital investment appraisal process?
F : Q11 to Q14	**RQ3**: Do Libyan firms face capital rationing? And if so, is it externally or internally imposed?
In this phase of the research D : Q5	**RQ4**: Does the availability of Islamic Finance affect Libyan firms' view of the capital investment appraisal process?

These questions were first written in English. They were designed to be as clear as possible so that all of the interviewees could understand them easily; these questions also acted as a pilot for the postal questionnaire since it was hoped that ambiguities would emerge during discussions with the interviewees when there was a possibility for any confusion to be corrected by the interviewer. After revising these questions with native English speakers and colleagues at the University of Dundee, they were translated into Arabic and revised with Libyan colleagues at Benghazi University in Libya; these colleagues were native Arabic speakers but had a sound grasp of English (from their educational background), so that it could be confirmed that the Arabic version had the same meaning as its English counterpart. (See Appendix B for more details on the interview documents).

The sample of interviewees was designed to meet a number of criteria; First, the participants in the firms and banks had to be at a senior level of administration in

their organisation so that respondents would be likely to be knowledgeable about the investment appraisal process; Second, the firms were drawn from several economic sectors so that a mix of views was heard. Third, the respondents were drawn from banks and firms with different ownership structures. The research targeted 20 to 25 interviewees divided into two groups[81]. In the first group (capital users or insiders) interviewees from firms operating in five different sectors (Oil and Gas, Manufacturing, Food Industry, Financial firms and Services Firms)[82] were targeted, while the second group (outsiders) involved four sub-groups; a number of bankers, each representing a different firm, plus one government body (all as capital providers), academics, and chartered accountants. All interviewees, particularly in the firms and banks, were required to have direct involvement in the capital investment decision-making process (e.g. holding position of Chief Executive Officer 'CEO', Chief Financial Officer 'CFO', Member of the Board 'MB' and/or a similar level of responsibility in their organisation, for instance, 'Head of Department').

The interviews were conducted between early November 2009 and mid-January 2010. The meetings took place in the three largest Libyan cities (Tripoli, Benghazi and Misrata) because the vast majority of companies and banks have their offices in these locations, in particular Tripoli, the capital. A number of features made access to particular interviewees difficult. For example, there is no record of all companies

[81] The range 20-25 was selected since it was thought that this sample size would be large enough to enable a range of voices to be heard and, from a particular point of view, being fitted in within the time frame available for the fieldwork.

[82] This distribution closely resembles the Libyan economy, and the economic sectors used in this study are similar to those employed in previous studies, such as those of AlObeidi (1985) and Buferna (2005).

operating in Libya, either for national and international firms.[83] Thus, instead of choosing the sample companies from a general list of firms, the researcher relied mainly on the practical availability of firm contacts, while also trying as much as possible to keep to the sample criteria that had been set. In addition, the long distances between these cities (for instance, the distance between Tripoli and Benghazi is 1000 km) and the total absence of public transport meant that some of the original interview targets became untenable.

Telephone were made to obtain an appointment for the interviews and in some cases the interviewees requested a copy of the questions in advance. Typically, more than one call was made and on many occasions the appointment date was changed several times before the researcher conducted the interview. In total, 23 interviews were held, but three of these were subsequently excluded from the analysis because the participants quickly indicated that they did not know anything about the topic of the research and curtailed the session[84]. For the remaining 20 interviews, the questionnaire was used to prompt questions and ensure that all the topics were covered. However, as these were semi-structured discussions, the interviewees were given the chance to raise any related points which they believed to be important and which were not already covered. Explanations and examples were given when necessary to expand on some questions in order to obtain clear answers about the topic being considered. In some cases, supplementary questions were asked to gain a deeper understanding of the interviewees' opinions or the ideas raised by the

[83] Buferna (2005) stated this as one of the main limitations in his study on determinants of capital structure in Libya. In addition, the Libyan Stock Market (LSM), established in 2007, has less than 15 members, the vast majority of which are financial service firms (banks and insurance companies).

[84] A three interviews lasted less than 15 minutes. The participants refused the idea of recording the interviews on tape; one of them stopped the session after he admitted that he did not have the information which would allow him to answer the survey questions. The other two participants tried to interact with the questions, but the information provided was totally unrelated to the questions' topics.

participants. A full explanation about the purpose of the research was given to each individual at the start of each meeting, however no attempt was made to influence the opinions of the participants. On average, each interview lasted 45 minutes; in addition to the detailed notes that were taken, 16 participants agreed to be recorded. In the case of the 4 unrecorded interviews, very detailed reviews were written up immediately after completing the interview, in order to document any extra information which may not have been included in the notes made during the sessions. The recorded interviews were transcribed and analysed[85] before being summarised.

In terms of the two sub-sample groupings, 12 interviews were conducted with insider officials in firms from five different economic sectors (two each from financial firms (FF), service firms (SF), oil and gas firms (OG), food industry firms (FI) and four manufacturing firms (MF)) while eight interviews took place with outsiders: four bankers, two academicians and two chartered accountants. Mixed ownership structures were represented among the 12 firms involved: 60 per cent were State-Owned, 20 per cent were Private Enterprises and 20 per cent were a mix of the two; this mix was not surprising since as Chapter 2 pointed out, in Libya, the majority of firms are still State-owned. The interviewees' positions varied across the sample: 30 per cent were CEOs, 20 per cent were CFOs, 20 per cent had the title of Head of Department, 15 per cent were Board Members, 10 per cent were Chartered Accountants and 5 per cent were Academics[86].

[85] Analysis depends mainly on listening to the recorded interviews many times and reading through the transcript of the interviews in light of the notes that were taken during and shortly after the interviews. This information was then grouped to identify patterns in the interview responses.

[86] More details about the backgrounds of the respondents and more details about the firms, such as the ownership, size and number of employees are supplied in Section 5.2 in Chapter Five, where the results from the interviews are discussed.

4.5.2 Questionnaire Survey

Oppenheim (1992) and Sekaran (2003) defined a questionnaire survey as a data collection tool whereby each individual in the research sample participates by answering a number of written questions. It is one of the most widely-used data collection methods in social science studies where a large sample of opinions is being canvassed (Oppenheim, 1992). The questionnaire survey can be used in both phenomenological (subjectivist) and positivistic (objectivist) research (Kumar, 2005; Saunders et al., 2009). The questionnaire survey has become a more popular instrument for collecting data over the last century as the postal service in most countries is reliable and cheap so that distribution is relatively easy. In addition, with the development of computing power, the ability to analyse a large sample of responses to a sizeable number of questions is feasible (Sharp et al., 2002).

Questionnaires can be classified into two main categories in terms of the general format (Sekaran, 2003). The first type is the open-ended questionnaire survey in which the participants are free to answer the questions by writing comments to very broadly-set questions. This type of questionnaire may be easy to draw-up, but hard for the participants to answer; answers may also be more challenging to code and analyse (Oppenheim, 1992). The second type is the closed-end questionnaire survey where the participants are asked to select an answer to a 'Yes' or 'No' question (Stacey, 1970). De Vaus (1990) stated that there are several factors which play an important role in deciding on which of the two types is preferable. For instance, respondents' expertise and motivation are key factors in this process. In addition, administrative issues, question content and the time available to develop the questions play a role in whether an open-ended or closed-end survey is used.

Surveys can take one of several forms: postal, telephone, internet and face-to-face (Blaxter et al., 2010). In a face-to-face (interview-completed) survey, the participants are contacted personally by the researcher. This way of conducting a questionnaire allows the researcher to ascertain the answers in writing whilst at the same time clarifying any questions (if necessary) (Saunders et al., 2009).

The face-to-face semi-structured interviews that were conducted in the first phase of this study provided the researcher with an initial understanding of the concerns of a small sample of respondents about the capital investment appraisal process in Libyan firms. However, a small sample of interviews is unlikely to provide an adequate basis for meaningful generalisation. Therefore, conducting a questionnaire survey can be a way of overcoming these limitations and discovering the views of a larger number of participants.

However, the use of the questionnaire survey has several shortcomings. The most obvious problems relate to the low response rate that may be achieved plus the difficulty of dealing with unanswered questions. Respondents may also misunderstand or misinterpret a number of the questions because of a lack of interest in or knowledge about some issues relating to the topic. The self-selecting bias of respondents is a further disadvantage of using questionnaire surveys; those respondents who do participate may exhibit different motivations or attributes when responding to questions than non-respondents. In the case of a very low response rate, this may have a serious impact on the findings since the questionnaire results may not reflect the real opinions of the study population (Kumar, 2005). The literature shows that respondents usually read all the questions in advance before starting to complete the research instrument. To some extent, this may have an influence on the independence of both the questions and the answers. In the case of

closed-end questionnaires with a limited number of pre-determined possible answers, respondents are not allowed to express their opinions freely (Bryman, 2004; May, 2005).

The self-administrated (delivering and collecting personally)[87] closed-end[88] questionnaire was chosen in this research for a number of reasons. First, according to the literature, the self-administrated survey tends to achieve a higher response rate relative to other questionnaire methods (Hussey and Hussey, 1997). Second, mail services in Libya are outdated and inefficient; buildings, houses, streets and areas are not coded and so, organisations and individuals do not rely on the conventional mail system; instead, they use a post box system, usually located inside post offices (Kribat, 2009). In addition, low rates of internet usage remain in Libya and email systems are not extensively employed by both individuals and organisations; thus, they cannot be used as a means to conduct a questionnaire.

In terms of designing the questionnaire, and in order to greatly increase the effectiveness of the research instrument in this study, a number of considerations were taken into account. Accordingly, it was decided to design the instrument in such a way so as to minimise commonly noted problems with surveys and reduce any consequential biases[89] in the research (Sekaran, 2003). For example, it was decided that: (i) the language used in the questionnaire should be easy to understand by the respondents; (ii) the type of questions contained in the final questionnaire version should be clear and concise; (iii) the length of the questionnaire should be as

[87] Babbie (1998) described self-administered questionnaires as the best tool available to social scientists for collecting original data for describing a population to be observed directly.

[88] Compared to open-ended questions, closed-end questions' answers are easier to code and analyse. On the other hand, closed-end questions might push the respondents toward one of the given predetermined alternative answers that is different from what is in the respondent's mind (Collis and Hussey, 2009).

[89] For more details about reducing questionnaire bias, see Sekaran (2003) (p. 235-242).

short as possible since this has an influence on the response rate - the longer the questionnaire, the lower the response rate that is usually achieved (Sharp et al., 2002). Thus, the questionnaire in this study was designed to take no more than fifteen minutes to complete and to not exceed more than eight A4 pages.

Based on these points, the following issues were taken into consideration while designing the questionnaire. The terms and words in questions were chosen for ease of understanding. In order to increase the response rate by reducing the time which the survey would take, the questions were kept as short as possible. Additionally, the number of questions were kept to a minimum and a mix of closed-ended as well as open-ended questions were employed in order to encourage respondents to provide the required information in a form which could easily be analysed statistically. At the same time, the open-ended questions allowed participants to raise any issues that might not have been covered elsewhere in the survey.

The importance of the logical structure and ordering of the questions in the questionnaire was also taken into account. Indeed, the general layout was chosen so as to ensure that each participant would understand the questions (Kumar, 2005; Collis and Hussey, 2009). Furthermore, in order to encourage the participants to complete and return the questionnaires, the instruments were designed in what was hoped would be an attractive format, consequently increasing the rate of response (Kumar 2005). All these elements were carefully decided upon in order to maximise the reliability and the validity of the survey (Saunders et al., 2009).

As mentioned earlier, the self-administrated questionnaire was chosen as the survey method, where all the questions are closed-ended apart from one open-ended question which gave each participant the chance to raise any points not covered by the other questions.

The questionnaire contained 28 questions in total. Twelve of the questions used a five point Likert scale (where the possible responses ranged from (5)-completely important to (1)-completely unimportant). Eleven of the questions used straight-forward yes/no answers, while others initially sought a yes/no answer and, based on the reply, a follow-up question involving a five-point Likert scale. Most of the questions offered the participant the option to add any answer not suggested or to add an explanation for a particular answer. The rest of the questions were designed to collect background and general information about the participants and the companies[90].

The questions were prepared after the completion of the literature review and a close examination of the previous studies in the area. Specifically, those prior investigations that had employed a questionnaire to conduct research in the area of capital investment were studied, such as: Klammer and Walker (1984), Pike (1983, 1988, 1996), Sangster (1993), Kester and Chong (1998), Abdel-Kader and Dugdale (1998), Arnold and Hatzopoulos (2000), Eljelly and Abuidris (2001), Lazaridis (2004), Toit and Pienaar (2005), Eluilade et al. (2006), Correia and Cramer (2008) and Khamees et al. (2010). Additionally, the questionnaire design process was influenced by the results of the interviews in the first phase of this empirical study. For instance, the section in the interviews covering real options and the techniques used when investing in AMT were excluded from the questionnaire because the interviews clearly demonstrated that Libyan capital investment decision-makers do not consider such issues when deciding on new investment. Instead, a new topic, Islamic Finance (IF) was included in the questionnaire because interviewees

[90] For more detail on the questionnaire documents see Appendix C.

emphasised it when asked their opinion about the interest rate and the cost of capital calculation in investment appraisal.[91]

Table 4.2 illustrates the link between the questionnaire sections and the research questions:

Table 4.2 The Link between the Questionnaire Sections and the Research Questions

Questionnaire sections	**Main Research questions**
A : Q1 to Q8	Background information about participants and their companies
B : Q9 to Q11 D : Q15 to Q17	**RQ1**: How do Libyan firms appraise capital investment?
C : Q12 to Q14	**RQ2**: How do Libyan firms incorporate risk into the capital investment appraisal process?
E : Q18 to Q21	**RQ3**: Do Libyan firms face capital rationing? And if so, is it externally or internally imposed?
F : Q22 to Q26	**RQ4**: Does the availability of Islamic Finance affect Libyan firms' view of the capital investment appraisal process?
G : Q27 to Q28	General: The influence of outsider groups and any other issues raised by the participant

The final version of the questionnaire included 28 questions divided into seven sections: background information, appraisal techniques, risk, decision-making procedure and control, capital rationing, Islamic finance, general (primarily the influence of outsider groups such as banks and chartered accountants on the investment appraisal process). The questionnaire was written in English first and then translated into Arabic, the primary language in Libya, making it more accessible for respondents than working with the English version. Both versions

[91] See Chapter 5 for more detail on the interviews result.

(English and Arabic) were reviewed by PhD colleagues at the University of Dundee and the University of Benghazi who, while being native Arabic speakers, had a good command of English; this ensured that the Arabic version of the posted questionnaire had the same meaning as its English counterpart and hopefully avoided any bias associated with the questionnaire translation process[92]. In addition, these individuals completed the instrument as a pilot study in order to provide insights about the questionnaire and the questions from a respondent's perspective (Ghauri et al., 1995; Sekaran, 2003). As a result of this review process, some modifications and adjustments were made; in addition, some explanatory notes were added to the Arabic version to further insure that the participants understood the question in Arabic as in English. In any case, the self-administrated questionnaire gave the researcher the chance to explain and clarify any question to the participants.

The sample was designed to survey 200 firms, each firm being presented with one questionnaire form. The selected companies were distributed across five economic sectors: service firms (SF), manufacturing firms (MF), oil and gas firms (OG), companies in the food industry (FI) and financial firms (FF); some 40 companies in each sector were selected with different ownership forms and various capital sizes influencing the choice. This phase of the research was conducted in the period from the middle of June 2010 to the end of July 2010. Questionnaire forms were distributed personally by hand. Because of the absence of a reliable postal service in Libya, it was impossible to send them by mail; therefore, the questionnaire was delivered personally to a large number of companies. However many of them refused to take part in the survey or complete the questionnaire form. For these reasons, the final number of companies which participated in this study was 97.

[92] The process of questionnaire translating has been likened to walking through a series of mine fields (Oppenheim, 1992).

These questionnaire forms were distributed in the three largest cities throughout the country: the capital Tripoli, Benghazi (the second largest city) and Misrata. This process involved travelling between these cities by private motor transport and in most cases took more than three visits to the participant firms. In total, 45 of the 97 questionnaires were collected and all were usable (giving a 46.4 per cent response rate). The five economic sectors were represented as follows: 20 per cent were service firms (9 firms), 33 per cent were manufacturing firms (15 firms), 22 per cent were oil and gas firms (10 firms), 13 per cent were food industry firms (6 firms) and 12 per cent were from the financial sector (5 firms). In terms of capital size, the respondents' firms were varied; the smallest was worth only $783,699 whereas the largest had a value of $10.18 billion. The majority of the participants were at a senior level of management and were directly involved in the capital investment decision-making process; they held titles such as Head of Department, CFO and CEO (38 per cent, 31 per cent and 20 per cent, respectively).

4.6 Conclusion

The aim of this chapter was to outline the research methodology and methods employed in this study. The selection of the methodological approach was influenced by the paradigm typology outlined by Burrell and Morgan (1979). Burrell and Morgan stated that the important theoretical assumptions of the researcher should be well articulated before conducting any empirical work to ensure that the ontology, the epistemology, methodology and methods are consistent with each other and with the key objectives of the research. The interpretive paradigm was selected for the present study because of the nature of the topic under investigation, that is, exploratory study of the capital investment appraisal process in Libyan firms,

where the required data are mostly qualitative and subjective in nature. The chapter then outlined the two research methods employed to conduct the empirical work in this thesis. Semi-structured interviews were noted as the first phase of the empirical work chosen, in order to gain a better understanding and relatively deep insight into the research topic and the issues surrounding it in the Libyan environment. The second phase of the empirical work was outlined as being a questionnaire survey which aimed to covering a larger sample and focus on obtaining more detailed data about certain issues raised in the interviews as well as the extant literature.

Having outlined the contextual backdrop to the research in the first half of the thesis, the next chapter, Chapter Five, begins the presentation of the empirical research by describing and discussing the results of the interview study.

Chapter Five

Semi-Structured Interview Results

5.1 Introduction

The purpose of this chapter is to present the results of the semi-structured interviews. These interviews sought opinions about the issues highlighted in the review of the relevant literature. In addition, the discussions with the interviewees allowed a national perspective to emerge from those knowledgeable about the topic of investment appraisal in Libyan companies; to date, most of the literature is dominated by a Western, developed-country point of view. As outlined in Chapter 4, the sample of interviews was split into two groups: namely, "insiders" including representatives of firms and "outsiders" which involves bankers, academic, and chartered accountants. The split facilitated the comparison between the two groupings consulted and enabled the opinions between insiders and outsiders to be contrasted.

The use of semi-structured interviews as the research tool in this thesis reflects the desire to obtain a relatively deep understanding of the way in which capital investment decision-makers in Libyan companies deal with issues. In addition, any findings from the interviews may provide a guide for the design of other research methods used in this study, such as the questionnaire investigation that follows in the next chapter.

This chapter is divided into nine subsections. Following the introduction, Section 5.2 provides details about the sample selection process and the interviewees' backgrounds. The third section (Section 5.3) discusses responses regarding the impact of recent changes in the Libyan economic environment on the investment appraisal process. Section 5.4 describes the interviewees' opinions about appraisal techniques used by firms which invest in capital projects within Libya. The fifth section outlines views on the risk assessment procedures employed within Libyan

firms, before opinions about the decision-making process and control phases are discussed in Section 5.6. Section 5.7 focuses on interviewees' responses to questions about the importance of capital rationing within Libya. Section 5.8 then describes the participants' views regarding the potential use of real options, flexibility, as well as AMT-based techniques when analysing capital expenditures in Libya. Section 5.9 summarises the findings and concludes the chapter.

5.2 Sample Selection and Interviewee Details

Twenty interviews were conducted between the end of November 2009 and mid-January 2010; the meetings took place in the three Libyan cities where the majority of the nation's firms and banks are located: the capital Tripoli, Benghazi and Misrata. The sample combines two groups of the interviewees: managers within firms and "outsiders"[93]. The first group consisted of executives from 12 firms (i.e. those making the capital investment decisions) from five different economic sectors (the oil and gas firms (OG), the manufacturing firms (MF), the food industry firms (IF), the financial firms (FF), and the services firms (SF)). The second group was made up of four bankers (i.e. capital providers), two academics and two chartered accountants.

The corporate and banker interviewees were at different administrative levels within their organisations, but all were directly involved in capital investment decision-making processes (e.g. CB1 is the head of credit department in the bank).

[93] The target was to obtain between 19 and 26 interviews with between 10 to 15 firms (insiders or capital users) operating in five different sectors (Oil and Gas, Manufacturing, Food Industry, Financial, and Services sector) and between 9 to 11 outsiders that include four Banks and one Government Body (capital providers), two or three academicians, and two or three chartered accountants (for more details see chapter four: Methodology).

Table 5.1 provides background details about each of the 20 interviewees: a visual inspection of the table indicates that the 12 corporate officials interviewed included six chief executive officers (CEOs), four chief financial officers (CFOs), one member of a board of directors (MB), and one head of an internal auditing department (HIA Dep.).

Table 5.1 Summary Details about the Interviewees

Panel A: Companies						
Interviewees	Age	Qualification	Subject	Place	Experience	Position
C1	31-40	MSc	Accounting	UK	12 Yr	CFO
C2	> 50	PG Dip.	Accounting	UK	7 Yr	CFO
C3	31-40	MSc	Engineering	Canada	5 Yr	CEO
C4	> 50	BSc	Engineering	Libya	25 Yr	CEO
C5	41-50	MSc	Accounting	UK	4 Yr	CFO
C6	31-40	MSc	Accounting	Libya	14 Yr	MB
C7	> 50	Other	None	Libya	25 Yr	CEO
C8	41-50	BSc	Engineering	Libya	13 Yr	CEO
C9	31-40	PG Dep.	Management	Libya	6 Yr	CEO
C10	31-40	BSc	Engineering	Libya	14 Yr	CEO
C11	41-50	< BSc	Accounting	Libya	13 Yr	HIA Dep.
C12	31-40	MSc	Accounting	UK	15 Yr	CFO
Outsiders:						
Panel B: Banks						
CB1	41-50	BSc	Economics	Libya	20 Yr	HC Dep.
CB2	> 50	PhD	Accounting	UK	8 Yr	MB
CB3	> 50	PhD	Finance	US	7 Yr	MB
SB4	41-50	BSc	Accounting	Libya	2 Yr	HI Dep.
Panel C : Academics						
A1	41-50	PhD	Accounting	Canada	22 Yr	Academician
A2	> 50	PhD	Accounting	UK	32 Yr	Academician
Panel D: Chartered Accountant						
AP1	> 50	MSc	Accounting	US	40 Yr	CA
AP2	31-40	MSc	Accounting	Libya	10 Yr	CA

Note: This table provides background details about the twenty interviewees. **Key**: **Place**: Place of graduation; **C:** Companies; **CB**: Commercial Bank; **SB**: Specialised Bank; **CEO**: Chief Executive Officer; **CFO**: Chief Financial Officer; **MB**: Member of Board; **CA**: Chartered Accountant; **HIA**: Head of Internal Audit; **HC**: Head of Credit Dep.; **HI**: Head of Investment Dep.; **A:** Academician; **PG Dip**: Postgraduate Diploma.

The vast majority of the interviewees were well-educated (all but two of the sample had a Bachelor's degree; half had attained their qualifications in Libya while the rest had graduated from the UK or North America). The "outsider" interviewees (in banks, academia and chartered accountants) had a background in the accounting

area, while those who worked in firms (Panel A) had a mix of accounting, engineering and, in one case, management-based degrees.

Table 5.2: Summary Details of the Companies, Banks, Sectors and Ownership.

Interviewees	Sector/Ownership	Main source of funding	Capital in millioms US$	Employees
Panel A: Companies				
C1	Financial; SO	The State / others(self-funding)	$393.701	400
C2	Services; SO	The State/ others(self-funding)	$78.740	7000
C3	Oil & Gas; P:N-I	Other(self-funding)+SOBanks	$1.969	40
C4	Manufacturing; SO	The State	$393.701	1171
C5	Oil & Gas; M:SO-I	The State & Foreign Partner	$1,181.102	2000
C6	Manufacturing; SO	The State/ others(self-funding)+both-Banks	$1,023.622	6800
C7	Manufacturing; P:N	Other(self-funding)	$1.575	25
C8	Food industry; P:N	other(self-funding)+both_Banks	$55.118	600
C9	Manufacturing; P:N	Other(self-funding)+SOBanks	$4.189	33
C10	Services; M:SO-I	The State+Banks+Other(self-funding)	$78.740	3800
C11	Food Industry; SO	Other(self-funding)	$53.543	3460
C12	Financial; SO	The State	$6.693	280
Panel B: Banks				
	Sector\Ownership	**Size of Annual Investment (lending) Budget**	**Average Size of Investment Project can be funding**	
CB1	Commercial Bank; P:N	$31.5M	Not more than $7.9M	
CB2	Commercial Bank; SO	$78.7M	from $7.874M and $78.7M	
CB3	Commercial Bank; M:SO-N-I	$189m	up to $78.7M	
SB4	Specialist Bank; SO	$78.7M	from $11.811M to $63M	

Note: This table provides details about the sixteen interviewees organisations (firms and Banks). **Key**: **SO**: State-Owned; **P**: Private; **M**:Mixed; **N**: National Capital; **I**: International Capital; **C:** Companies; **CB**: Commercial Bank; **SB**: Specialised Bank.

In addition, 90 per cent of the sample had more than five years of experience in their current position, suggesting a reasonable degree of familiarity with the topics examined in this thesis. This level of experience was not uniform across all categories of interviewee. Unsurprisingly, the average of those in banking was lowest since many banks within Libya have only recently been established or privatised after they were originally State-owned institutions (Zagoub 2011;

Abouzkeh 2012). In terms of ownership, Table 5.2 documents that the firms and banks where interviewees worked included a selection of private, State-owned, and mixed ownership firms that were drawn from five sectors. The sample clearly represents a wide range of organisational size so the findings should not be specific to any one type of company; the figures for capital employed ranged from US$ 1.575m for C7's employer to a high of US$ 1181.102m for C5's firm. This impression is confirmed by data about the number of employees, which varied from a low of 33 staff in C9's company to a high of 7000 staff in C2's firm. [94]

As Chapter 4 mentioned, two versions of the semi-structured interview document were prepared; the first version was for those who worked in firms and the second was for outsiders (i.e. the bankers, academics and chartered accountants). This decision was taken in order to make the questions as relevant as possible for the individuals being interviewed. However, only minor changes were made to the different questions so as to facilitate a comparison among the responses obtained.

Each version consisted of 19 questions[95] that were used as a checklist and a guide to lead the interviews. The questions were divided into seven sections as follows: background information; investment context; appraisal techniques; risk; decision-making and control procedures; capital rationing and real options; and investing in advanced manufacturing technology (AMT)[96]. The two versions all contained

[94] This is not an uncommon approach. For example, Helliar et al. (2002) adopted a similar strategy when asking different groups about their attitudes to risk.

[95] For more details about the design of the questionnaire and how the questions reflect previous studies, the research questions and the results of the interviews in the first stage of the research, see Section 4.5.2 in Chapter 4.

[96] The interview documents are provided in Appendix B. the question. See Chapter Four: for more details about the process of designing the semi-structured interview document.

the same themes and questions, but they were put in different formats to suit the subject group being interviewed. For example, Question 3 for companies was:

"Do you think that investment appraisal techniques play a fundamental role in investment decisions or are there other factors including Non-financial criteria that override the results of these techniques? Can you suggest what these factors are?".

The same question for outsiders was split into 3 parts: For example, interviewees at banks were asked:

Q3(a): "Do you think that investment appraisal techniques play a fundamental role in Libyan firms' investment decision-making or are there other factors including non-financial criteria that override the results of these techniques? Can you suggest what these factors are?"; Q3(b): "Do you think that investment appraisal techniques should play a fundamental role in Libyan firms' investment decision-making or are there other factors including non-financial criteria that should override the results of these techniques if that are necessary? Can you suggest what these factors should be?" and Q3(c): "Do you try to influence them to use the techniques to make their decision?".

For academics the questions were phrased slightly differently to take account of the different audience:

Q3(a): "Do you think that investment appraisal techniques currently play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that override the results of these techniques? Can you suggest what these factors are?"; Q3(b): "Do you think that investment appraisal techniques should play a fundamental role in Libyan firms' investment decision-making or are there other factors including non-financial criteria that should override the results of these techniques if necessary? Can you suggest what these factors should be?" and Q3(c): "Do you think that the Libyan accounting education system can influence any of these matters?".

For chartered accountants the questions were re-phrased along the following lines:

Q3(a) "Do you think that investment appraisal techniques play a fundamental role in Libyan firms' investment decision-making or are there other factors including non-financial criteria that override the results of these techniques? Can you suggest what these factors are?"; Q3(b): "Do you think that investment appraisal techniques should play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that should override the results of

these techniques if necessary? Can you suggest what these factors should be?" And Q3(c): "Do you think that the Libyan accountancy profession can influence any of these matters?" [97]

All the interviews were conducted by the researcher on a face-to-face basis. At the start of each discussion the interviewees were allocated codes, thereby providing some reassurance that their anonymity would be maintained. The average length of each interview was 42 minutes; comprehensive notes were taken by the researcher during the discussions and significant statements and responses were documented. In 16 out of the 20 interviews, permission was given to have the discussions recorded and in these cases, the interviews were transcribed and then analysed to determine the important views that were expressed. In the remaining four cases, detailed summaries were written up immediately ofter each interview finished and these, together with the interview notes, were analysed when summarising the findings (see Chapter 4 for more details).

5.3 Results

5.3.1 The Libyan Investment Context

At the start of each interview, questions were asked about the impact of recent changes in Libyan economic policy on the investment environment; Table 5.3 summarises the responses to these questions. An analysis of this table reveals that in the years immediately preceding the study, most interviewees recognised that the Libyan government had undertaken a programme of economic reform which was

[97] See chapter 4: for more details about the process of designing the semi-structured interview document.

intended to re-build the private sector and encourage local as well as international capital investment in the country. These reforms followed a period of more than 20 years where Socialist[98] polices involving the wholesale nationalisation of Libyan industry had been implemented by the leader of the country, Muammar Al-Gaddafi. Therefore, the interviews began by considering the impact of the recent economic reforms which the Al-Gaddafi regime had instigated. According to Table 5.3, a majority of the interviewees argued that the recent economic reforms had a positive impact on the Libyan investment environment. However, 3 of the 12 firm–based interviewees either expressed negative opinions or were unclear in their views about the impact of the economic changes which had taken place. Moreover, interviewees such as C3, C6 and C9 argued that even if the newly introduced investment laws or tax and custom exemptions for domestic as well as foreign investors were having a beneficial impact on corporate investment, many real problems had not been addressed by the changes which were taking place; they suggested that these problems were limiting the competitiveness of the Libyan economy. For instance, they pointed to the (manipulated) unemployment rate and the high degree of business uncertainty as issues which were not being tackled by the Gaddafi regime.[99]

Interviewee C4, the CEO of a State-owned manufacturing company, described a key problem faced by Libyan firms, in particular, those in the public sector which recent reforms had failed to address:

[98] This ideology limited the role of the individual in ownership of economic activities and did not allow private sector participation in such areas in Libya (for more details see chapter 3: Libyan Economic Environment).

[99] For example, those individual highlighted how State-owned firms were obliged to hire a certain number of people if the unemployment rate was thought to be too high whether there was a need for the extra staff or not.

> *"Most of these changes are in favour of the private sector and foreign investors, in terms of tax and customs exemptions. However, State-owned companies suffer from problems of employment in excess of the company's need which is mandated by politicians, and that is causing the increase in production costs and low productivity; hence, these companies are unable to compete in the market."* C4

The uncertainty generated by the economic changes was raised by interviewee C9, now the CEO of a State-owned manufacturing company; he argued that:

> "*The aims of these laws and procedures are entirely positive, but they are hampered by instability in the administrative institutions in terms of the proceedings and the implementation of these laws. In addition to a conflict and contradiction in many of the authorities, there are conflicts and contradictions in the decisions issued by these authorities to regulate the economy"*C9

He argued that this problem was especially acute for his type of company:

> *"The company is linked heavily with the State economy as a whole; consequently, all these unstudied and irrational decisions negatively affect the individual company"*C9

This interviewee went on to suggest that uncertainty hampered the accuracy of future predictions - one of the key inputs into the investment appraisal decision:

> *"If we compare Libya with other economies there is a difference; the margin of error in predicting the future for a more stable environment might be plus or minus 5 per cent, but in the Libyan economy it could be plus or minus 50 per cent."* C9

In contrast, all the interviewees from the outsider groups (bankers, academics and chartered accountants) put forward positive views about the recent changes. However, even in these cases, a number of reservations were expressed, with interviewees CB2 and A2 both suggesting that the changes might not be sufficient to ensure that the desired aims of the reforms to the Libyan economy would be achieved. In this context, interviewee CA1, a chartered accountant, pointed to the

lack of a strategic dimension to firms' investment decision-making, despite the economic changes which had occurred. He stated that:

> *"I do not think that Libyan companies have yet come up with a comprehensive set of investment policies, but there are opportunities for investment and companies exploit these from time-to-time. As a result of these opportunities - and the recent changes that have taken place in the Libyan economy, including the establishment of private banks – companies have tried to take advantage of each project as it arises instead of following policies based on strategies prepared by Government departments in advance."* CA1

Table 5.3: Investment in the Libyan Environment

	Ownership	Impact of Changes in Libyan Investment Context	Proposed New Project in Near Future	Proposed Sorce of Fund
Panel A: Companies				
C1	SO	Positive	Yes	O
C2	SO	Positive	Yes	O+Se+B
C3	PNI	Positive	Yes	PNI+B
C4	SO	Positive	Yes	PFI+B+Se
C5	MSOI	Not clear	Yes	O
C6	SO	Positive	Yes	PFI+B+Se
C7	PN	Negative	Yes	B+Se
C8	PN	Positive	Yes	B
C9	PN	Both	Yes	PFI+B+Se
C10	MSOI	Positive	Yes	O
C11	SO	Positive	No	N/A
C12	SO	Positive	Yes	Se
Outsiders				
Panel B: Banks				
CB1	PN	Positive	-	-
CB2	SO	Positive	-	-
CB3	MSONI	Positive	-	-
SB4	SO	Positive	-	-
Panel C : Academics				
A1	-	Positive	-	-
A2	-	Positive	-	-
Panel D: Chartered Accountants				
CA1	-	Positive	-	-
CA2	-	Not clear	-	-

Note: This Table summarises the responses of the twenty interviewees to questions about recent changes in the investment environment in Libya. **Key: SO:** State-Owned; **P:** Private; **M:** Mixed; **N:** National; **I:** International; **C:** Companies; **CB:** Commercial Bank; **SB**: Specialised Bank; **A:** Academician; **CA:** Chartered Accountant; **O:** Owner; **Se**: Self-funding; **B:** Banks; **PNI:** Private National Investor; **PFI:** Private Foreign Investor.

The overall impression that can be gained from the interviewees is that firms were adjusting to the new-found freedoms from State control which they had been granted over investment decision-making. In addition, they were getting used to the new private sector banks which had been set up, in terms of applying for the funding needed to underpin any capital budgeting plans[100].

A follow up question was put to firm managers in which they were asked if their companies have an investment project coming up in the near future and, if so, what source(s) of funding would be used to finance the expenditure. As shown in Table 5.3, 83 per cent of the interviewees said that their firms planned to undertake a new investment project in the near future and half of them planned to use more than one source of funding (mostly bank loans and self-financing). Such a result is hardly surprising since under the previous regime getting permission for capital spending was a difficult task with all economic activities under state-monitoring and control, including banks (Kilani, 1988; Mahmud, 1997; Buferna, 2005). As a result, a backlog of investments had built up. In addition, interviewees suggested that the newly established private companies which wanted to grow needed to spend money on plant and equipment. Thus, the issues being investigated within this thesis seemed pertinent to the development of the Libyan corporate sector and to the economy as whole.

[100] In particular, before economic reforms had been introduced, all businesses were State-owned (Kilani, 1988; Mahmud, 1997; Buferna, 2005) and as a result investment decisions had to be sanctioned by Government departments. In addition, the banks were 100% owned by Government (Kribat, 2009; Zagoub, 2011; Abouzkeh, 2012) so the funding for any investment had to be approved either directly or indirectly by the State.

5.3.2 Appraisal Techniques

Table 5.4 presents a summary of the interviewees' responses to three questions which enquired about the usage of investment appraisal techniques in Libyan firms. Libyan companies seem to be no exception to the well-documented global popularity of the payback method (PB) (Klammer and Walker, 1984; Sangster, 1993; Elumilade et al., 2006). The overwhelming majority (95 per cent) of the interviewees said that their firms used (11 out of 12 firm-based interviewees) or believed that firms used (i.e. 8 out of 8 the outsiders) the PB method to appraise capital investment projects, either with other techniques (75 per cent, 15 out of 20 interviewees) or on its own (20 per cent, 4 out of 20). Comparing this result with two earlier Libyan studies on the topic (AlObeidi, 1985; AlWakil, 2000), the finding suggests that here has been an increase in the popularity of the PB method among Libyan firms. For example, in 1985, AlObeidi discovered that 26 per cent of his sample of Libyan firms used PB while, in 2000, AlWakil found that this percentage was 74 per cent; both of these figures were lower than the percentages evident from the interviews undertaken in this thesis.

The dominance of PB is consistent with the results of previous studies in other countries such as those noted in Chapter 3. However, many studies (e.g. Pike and Neale, 2006; Arnold, 2008) have suggested that discounted cash flow (DCF) techniques have grown in popularity in recent years. The evidence from Libya, including that shown in Table 5.4, is consistent with this trend. For example, the use of NPV in Libyan companies rose from about 15 per cent in 1985 (AlObeidi, 1985) to 40 per cent in the current analysis. As with the previous evidence, the interviewees in this thesis suggested that DCF and PB are often now used in combination (Sangster, 1993; Elumilade et al., 2006; Pike and Neale, 2006). Table

5.4 shows that 75 per cent of the interviewees indicated that Libyan firms use PB and DCF together as a package of appraisal techniques.

Table 5.4: Appraisal Techniques

	Q2a	Q2b	Q2c	Q3a	Q3b	Q3c	Q4a	Q4b	Q4c	Q4d
Firms:	**Panel A: Companies**									
C1	PB,NPV,IRR, DPB	-	-	Yes	-	-	Yes	-	-	None
C2	PB, ARR,NPV,IRR	-	-	Yes	-	-	No	-	-	CA+A
C3	PB,ARR	-	-	Yes	-	-	Yes	-	-	B+ CA
C4	PB	-	-	Yes	-	-	Yes	-	-	B+CA
C5	None	-	-	No	-	-	No	-	-	B
C6	PB,NPV,IRR	-	-	Yes	-	-	Yes	-	-	CA
C7	PB	-	-	No	-	-	No	-	-	None
C8	PB	-	-	No	-	-	No	-	-	None
C9	PB,NPV,IRR	-	-	Yes	-	-	No	-	-	CA
C10	PB,ARR	-	-	Yes	-	-	Yes	-	-	B+CA
C11	PB, ARR	-	-	Yes	-	-	Yes	-	-	None
C12	PB,NPV,IRR	-	-	Yes	-	-	Yes	-	-	CA+A
	Outsiders									
Panel B: Banks										
CB1	PB, ARR	All	No	No	Yes	No	Yes	Yes	Yes	-
CB2	PB, ARR	All	No	Yes	Yes	No	No	Yes	No	-
CB3	PB,ARR,NPV,IRR	All	No	No	Yes	No	No	Yes	No	-
SB4	PB,ARR,NPV,IRR,BEP	All	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Panel C : Academics										
A1	PB,ARR	All	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
A2	PB,ARR,NPV,IRR	All	Yes	No	Yes	Yes	No	Yes	Yes	-
Panel D: Chartered Accountants										
CA1	PB	All	Yes	No	Yes	No	No	Yes	No	-
CA2	PB,ARR,IRR	All	No	No	Yes	No	No	Yes	No	-

Note: The table summarises the responses of the twenty interviewees about the questions related to appraisal techniques section. **Key: C:** Companies; **CB:** Commercial Bank; **SB**: Specialised Bank; **A:** Academician; **CA:** Chartered Accountant; **B:** Banks; **BEP**: Break-Even Point**; PB**: Payback; **NPV**: Net Present Value; **ARR**: Accounting Rate of Return; **IRR**: Internal Rate of Return; **DPB**: Discounted PB; **Q**: Question; **Q2a**:(for both groups) What techniques are the firm using?; **Q2b**: (for outsiders group only) What techniques do you think the firms should use?; **Q2c**: (for outsiders group only) Do you try to influence the firms to do so?; **Q3**a: (for both groups) Do these techniques play a role in the investment decision?; **Q3b**: (for outsiders group only) Do you think these techniques should play a role in the investment decision?; **Q3c**: (for outsiders group only) Do you try to influence the firms to do so?; **Q4a**: (for both groups) Does the size, the nature of the project and/or the funding source make a difference in terms of the techniques used?; **Q4b**: (for outsiders group only) Do you think different techniques should be used for different projects?; **Q4c**: (only for outsiders group) Do you try to influence the firms to do so?; **Q4d**: (for firms group only) Do the fund providers (banks), chartered accountant and/or academics attempt to influence any of these matters? (for more details about the questions see Appendix B).

The only firm-based interviewee who said that their company did not use any financial techniques to appraise new capital investment projects was C5 the chief financial officer in an oil company owned jointly by the Libyan State and an international investor. He outlined that capital projects in his company were only subject to 'technical' appraisal in terms of quantifying proven reserves and were not formally subject to financial scrutiny:

> *"There is only technical evaluation, because the company does not receive any income (as it does not sell its production directly), and it does not prepare feasibility studies, which are performed by the owners (Libyan National Oil Corporation LNOC and the foreign partner)"* C5

He expanded upon this answer by stating that:

> *"The oil and gas sector in Libya is an exception; for example, these companies do not finance the projects to produce oil or sell their products or collect their revenue. Even more unusually, they do not prepare proper financial statements; they do not have independent financial status. Financial matters of these companies are decided totally by the owners: either the LNOC or LNOC with a foreign partner."* C5

Thus, he did not rule out the possibility that investment appraisal techniques were used to evaluate any investment; he simply stated that such a financial appraisal was not undertaken by his firm but possibly completed by the international joint venture partner.

The outsider groups (bankers, academics and chartered accountants) were posed two extra follow-up questions; first they were asked: "what techniques should the firms use?" and second, whether they "attempted to influence firms to use particular techniques?".

Each of the outsiders said that Libyan firms should use all the four main appraisal techniques (PB, NPV, ARR, and IRR) to achieve the best capital investment decision; indeed, the responses indicated that other techniques (which are discussed less frequently in the literature) could be used as well. In response to the second follow-up question, the representatives of the three commercial banks stated that they did not try to influence firms in their usage of a particular appraisal technique.

Nevertheless, they did expect to see some financial calculations from loan applicants to satisfy themselves about the ability of a company to repay any amounts provided. However, the interviewee from the specialised bank, a State-owned, non-commercial entity whose main purpose was to support industrial development in Libya, indicated that they required investee firms to use traditional techniques in their feasibility studies. The academics argued that they encouraged companies to make use of the conventional techniques indirectly by teaching topics such as NPV, IRR, PB and ARR in educational institutions where they worked. Similarly, one of the chartered accountants stated that they encouraged firms to use these techniques through a service which they provided to clients; specifically, they offered to calculate NPVs, IRRs, PBs or ARRs when firms approached them for advice about putting together investment proposals.

When asked if the techniques play a role in the capital investment decision-making process in their firms, 75 per cent of the participants said "yes". It is worth mentioning that most of the interviewees who answered yes to this question stated that other factors such as social needs, strategic and developmental plans and political priorities could result in the output from these techniques being ignored, especially in State-owned firms (e.g. interviewees C1, C2 and C6). Thus, while

most indicated that financial appraisals were performed, the results only acted as a guideline for, or input into, the overall investment decision.

Some of the interviewees also mentioned that personal experience with the decision-making process played an important role in deciding whether or not an investment should proceed - possibly even more so than the techniques themselves. For instance, interviewee C1, the CFO of a State-owned financial firm, said:

> *"Yes. But sometimes there are other factors that may lead to accepting the projects, even if the appraisal methods showed that these projects are not the best economically. For example, political decisions to support or assist a particular region or particular industry, social factors, and developmental factors are important"*C1

He added that:

> *"In other cases, the project might be profitable, but if the CEO is not enthusiastic about the project because of a lack of experience in the sector or the industry, it will be rejected."*C1

and concluded, therefore, that:

> *"In the end, personal experience plays an important role in the Libyan market, thus these methods are merely an administrative procedure required to obtain funding."* C1

From a normative point of view, all eight outsiders answered yes when asked if investment appraisal techniques should play a role in the capital investment decision-making process, although only three (A1, A2 and SB4) said that they had tried to influence firms to use them.

Around half of the sample claimed that project-specific features (i.e. size, nature and/or source of funding for a project) did not play any role in influencing the choice of appraisal method to be employed. In terms of comparing the firms and the outsiders, seven of the twelve firms and three of eight outsiders agreed with this notion; for instance, interviewee C10 (the CEO of a State-owned firm with an international investor) and C11 (the head of internal audit at a State-owned firm) argued that if the project was large-scale, and/or if its funding involved loans, and/or if there was a foreign (investor) partner the appraisal would usually incorporate more sophisticated techniques such as NPV and IRR, along with PB and ARR. These views of managers are consistent with findings from previous studies such as Mills and Herbert (1987) and Pike (1996) who pointed to the role of contextual influences in the decision-making process surrounding capital expenditures in the developed world.

All the outsiders agreed that project features should influence the type of techniques used to appraise a project. Despite this unanimity, only 50 per cent of the outsiders group said that they tried to encourage firms to consider project-specific features. These findings suggest that outsiders' views about actual practices differ from what they believe should happen; the fact that half the sample apparently do not try to address this difference should be concerning to Libyan authorities.

Although outsiders claimed not to influence investment decision-making within firms, the chartered accountants were mentioned by seven interviewees as an influential group in the process while banks were highlighted by four others. Only two interviewees suggested that academics played a role in affecting which appraisal technique was used to evaluate investment within firms.

5.3.3 Risk

In this part of the discussion, interviewees were asked questions on two issues about how Libyan firms incorporate risk into their analysis; the first regarding the choice of a discount rate (the cost of capital), and the second relating to the importance of Islamic (interest free) finance on investment appraisal decisions. The results from these questions suggested that, contrary to the recommendations of standard (developed country-based) finance theory, only one firm, a State-owned financial company where C1 worked, used an "objective" approach for identifying the discount rate, in this case the WACC.

Seven managers explained that their firms adopted a subjective method for determining the discount rate. For instance, interviewee C2, the CFO in a State-owned services company, stated that his firm determined the discount rate according to the interest rate set by the Libyan Central Bank. Such an approach was thought appropriate since any funding requirement was supplied by the Central Bank; this organisation "charged" the services company for any funds borrowed based on the interest rate. The other four managers interviewed claimed that their companies did not calculate a discount rate or a cost of capital because they were State-owned firms and the funding of their projects was a decision for the owners - in this case the Government.

In this context, interviewee C5, the CFO of a State-owned oil company said:

> *"This firm does not calculate or determine its capital cost or internal rate of return, because the firm does not concern itself with the funding of its projects. The financing of new projects is the responsibility of the owners."* C5.

Table 5.5 Risk

	Q5a	Q5b	Q5c	Q6a	Q6b	Q6c	Q6d
Panel A: Companies							
C1	WACC	-	-	Yes, WACC+SEN	-	-	No
C2	SUB	-	-	NO	-	-	No
C3	SUB	-	-	Yes, SCE	-	-	CA
C4	SUB	-	-	Yes, SCE	-	-	B, CA, A
C5	NO	-	-	NO	-	-	No
C6	SUB	-	-	Yes, SCE+SUB	-	-	CA
C7	SUB	-	-	NO	-	-	No
C8	SUB	-	-	NO	-	-	No
C9	SUB	-	-	NO	-	-	No
C10	NO	-	-	NO	-	-	No
C11	No	-	-	NO	-	-	No
C12	NO	-	-	Yes, SCE+SEN	-	-	CA, A
Outsiders							
Panel B: Banks							
CB1	IR, No	Yes	No	SUB	OBJ, SUB	No	-
CB2	IR, No	Yes	No	SUB	OBJ	No	-
CB3	IR, No	Yes	No	SUB	OBJ	No	-
SB4	IR, No	Yes	No	SUB	OBJ	No	-
Panel C : Academics							
A1	No	Yes	No	SUB	OBJ	No	-
A2	No	Yes	Yes	SUB	OBJ	Yes	-
Panel D: Chartered Accountants							
CA1	No	Yes	No	SUB	OBJ	No	-
CA2	No	Yes	No	SUB	OBJ	No	-

Note: The table summarises the responses summary of the twenty interviewees about the questions related to appraisal techniques section. **Key**: **C**: Companies; **CB**: Commercial Bank; **SB**: Specialised Bank; **A**: Academician; **CA**: Chartered Accountant; **Q**: Question (for more details about questions see Appendix B); **IF**: Islamic Finance; **SUB**: Subjectively (they do not use one or more of the recommended methods, e.g. Scenario Analysis and Weighted Average Cost of Capital (WACC)); **OBJ**: Objectively (by using one or more of the recommended methods, e.g. Scenario Analysis and Weighted Average Cost of Capital (WACC)); **IR**: Interest Rate; **SEN**: Sensitivity Analysis; **SCE**: Scenario Analysis; **WACC**: Weighted Average Cost of Capital; **Q5a**:(for both groups) How do you select the discount rate (cost of capital)? What about Islamic Finance (IF)?; **Q5b**: (for outsiders group only) How do you think Libyan firms should select the discount rate (cost of capital)? What about IF?; **Q5c**: (only for outsiders group) Do you try to influence them to do so?; **Q6a**: Do you calculate an objective measurement of risk (firms)?, do Libyan firms calculate an objective measurement of risk (outsiders)?; **Q6b**: (for outsiders group only) Do you think they should calculate an objective measurement of risk?; **Q6c**: (for outsiders group only) Do you try to influence them to do so?; **Q6d**: (for firms group only)Do the fund providers, chartered accountants and/or academic attempt to influence any of these matters? (for more details about questions see Appendix B).

By contrast, all of the outsiders believed that Libyan firms set their discount rate subjectively. Indeed, the interviewees in the banking sector assumed that Libyan companies depended on the interest rate to determine their cost of capital since most were funded by debt. This was especially true before the stock market was established in 2007 and access to large amounts of equity financing was not

possible. Even with the launch of a domestic stock market, most respondents noted that very few Libyan companies were listed; those that did have a listing were mainly banks. Thus, the cost of equity component in the discount rate (i.e. the WACC) was not an important consideration for many firms.

In response to the two follow–up questions, the outsiders generally argued that Libyan firms should rely more on objective methods for determining their cost of capital or discount rate. However, with the exception of one of the academics, the outsiders indicated that they did not try to influence companies directly on their use of objective techniques to calculate the cost of capital. This evidence again suggests that the outsiders' perceptions of current practice and knowledge of theoretically preferred options differed, but no attempt was made (with the exception of some influence of chartered accountants which was felt by four firms) to address the issue.

Regarding the issue of Islamic finance, around 90 per cent of the participants said that they would prefer, or they believed that Libyan firms would prefer, Islamic finance contracts to the conventional financial products offered by banks. However, a more detailed analysis of the comments revealed that most respondents believed that currently available Islamic finance products were in reality ordinary commercial financial products with Islamic names. For instance, interviewee C6, a member of the board of a State-owned manufacturing company, described Islamic finance in the following terms:

> *"....We have one project funded by Islamic finance (Murabaha). But, there is a debate about the existing Islamic financial instruments, and whether these products really are in line with Shariah principles. There are banks, which are offering products that are Islamic in name, while in reality they are the same as other products provided by any commercial bank. However, Islamic finance is still one of our options...."* C6

The second question in this part of the discussion, asked participants, if they (in the case of firm-based interviewees) or Libyan firms (in the case of outsiders interviewees) calculated risk objectively, and if so, what methods did they use; if they did not, respondents were asked whether firms assessed risk subjectively. Only five managers in the companies group answered positively; they stated that their firms mainly used scenario analysis (C1 and C12) either on its own or in combination with other methods. The interviewees from the other seven companies claimed that their firms did not assess risk objectively. All of the outsiders group believed that Libyan firms deal with risk subjectively but, again, this contrasted with what they thought should happen (i.e. objective risk analysis). However, in line with previous findings in the chapter, the outsiders did not try to influence the firms to change their behaviour in this regard; in this case, none of the firms felt outsider pressure to alter their current practice.

In terms of a rationale for the lack of objective risk measures, interviewees CB2, a member of the board in a State-owned commercial bank and A2, a staff member in an accounting department at a Libyan University, suggested that the instability of policies regulating the Libyan economy made such an analysis difficult in practice. For example, A2 noted that:

> *"In the Libyan environment, risk is too great and is often unexpected. It is difficult to estimate risk in the Libyan economy. The main reason for this risk is the instability of economic policies and administrative policies as well as the instability of the decision-making governmental bodies which organise economic activities."* A2.

Given the relatively isolated position of Libya for many years before the interviews, it is hardly surprising that most interviewees only counted on domestic measures of risk. What is more surprising is that these domestic sources of risk were

ignored since they emanated from the Government or State-sponsored decision-making bodies. Thus, a culture of risk management appears not to have developed within Libyan firms.

5.3.4 Decision-Making and Control Procedures

In this part of the interviews, respondents were asked four open-ended questions about the decision-making processes which underpinned capital investment in Libyan firms; such as the source of ideas, the number of stages in the investment decision-making process and the use of ex-post audits. In addition to these four questions, follow-up questions were directed to specific interviewee groups to clarify their opinions on certain points. The majority (more than 90 per cent) of the firm-based interviewees characterised the capital budgeting process as having a number of stages. Most of the participants (more than 81.5 per cent of this majority) outlined a five-stage process[101], with the remainder identifying seven-stages[102] to the development and implementation of investment decisions. However, on closer inspection it was evident that the processes being highlighted by both groups consisted of the same broad types of activities. In describing the stages, the participants indicated that they overlapped and, in some cases, did not happen in what might be thought of as a logical order of occurrence; this complication was attributed primarily to market and political influences on the process.

[101] These five-stages are similar to those stated by Pike and Neale (2006) i.e. Determination, Search and Development, Evaluation, and Authorisation.

[102] A seven-stage model was suggested by Arnold (2008): Generation of ideas, Development of proposal, Project Classification, Screening, Appraisal, Authorisation and Implementation including Capital Expenditure and post-completion audit.

Table 5.6: Procedure of Decision-Making and Control (Part 1: Firms' version)

	Q7: How many stages are there in your firm's investment appraisal process?	Q8: Which of these stages are most important and require most time?	Q9: Where do the ideas for an investment come from?	Q10: Do you have an ex-post audit phase?	Q10d: Do the fund providers, CA and/or academician attempt to influence you to do so?
Panel A: Companies					
C1	5 stages	1- Detailed study. 2- Implementation.	Market study, the investors who promote their projects, our employees.	Yes	Education
C2	5 stages	1- Implementation. 2- Feasibility study.	Based on technical needs or instructions from the State for the implementation of some projects.	Yes, Closeout	No
C3	5 stages	Implementation.	From within the administration, the market or the needs of the sector, technical and \ or financial consultants.	Yes, One year	Chartered Accountants
C4	5 stages	1- Gathering ideas and discussing them in preliminary form. 2- Feasibility study	Market demand, technical needs and/or local or foreign investor ideas.	Yes	Chartered Accountants
C5	5 stages	Implementation.	Technical Needs	Yes	No
C6	5 stages	Feasibility study	Market study; technical needs	Yes, 2 yeas, every 3 months	Chartered Accountants+Fund Provider
C7	5 stages	Implementation	Market	Follow-up continuing a long the life of the project. Every 2 weeks	No
C8	5 stages	1-Feasibility 2-Implementation 3-Follow-up.	Market	Yes, continuously	No
C9	5 stages	1-Implementation 2-Feasibility study	Market	NOT exactly	Chartered Accountants
C10	7 stages	1-Implementation 2-Feasibility study	Onwers+ Technical needs+ Strategic instructions	Yes, two years, First Year every month, second year every three months.	No
C11	7 stages	Feasibility study	From technical divisions and market demand, or sometimes instructions from the owner.	Yes, one year in monthly base	No
C12	Not exactly, depend on the project	1-Feasibility study 2-Implementation	Often arise on the basis of political, social or development orientation, market demand, in some cases from foreign investors	General Follow-up every three months	Chartered Accountants +Education

Note: The table summarises responses of the twelve firm-based interviewees be questions regarding decision-making and control procedure. **Key: C**: Companies; **Q**: Question (for more details about questions see Appendix B).

Table 5.6: Procedure of Decision-Making and Control (Part 2: Outsiders' version)

	Q7a	Q7b	Q7c	Q8a	Q8b	Q8c	Q9a	Q8b	Q9c	Q10a	Q10b	Q10c
Panel B: Banks												
CB1	No	I do not know, but, I think it is positive adiea,	No	No idea	I think the feasibility study and Implementation	No	The market, copying other projects	Market study	No	I think they do.	I believe the should do so	Yes
CB2	No	I do not know, but, I think it is necessary to have them	No	Implementation	Feasibility study; Implementation	No	Copy Exisiting Projects; Personal Ideas	Real market study	No	I do not think so, because	Yes	No
CB3	No	I am not sure	No	Implementation	Feasibility; Implementation	No	Market	Real market study	No	Not Exactly	Yes	No
SB4	I do not know	I do not know. Yes	No	I do not know	I think study and appraisal phase	No	Market	Market study; New Ideas	Yes	I think so, but not in detail	Yes	No
Panel C : Academicians												
A1	No	I do not know, Yes	Yes	Planing; Implementation	Follow-up; all stages	Yes	Personal Ideas; The State	Market study	Yes	Usual follow-up, especially by the owners or financiers.	Yes	Yes
A2	No	I do not know, Yes	Yes	Implementation	Feasibility study	Yes	Copy other projects, Personal Ideas	Market study, Personal Experince	Yes	No	Yes	No
Panel D: Chartered Accountants												
CA1	No	I do not know, Yes	No	I do not know	Feasibility Study; Implementation	No	Copy others, Opportunity based on the state orientations, market	Market study	No	No	Yes	No
CA2	I do not know	I do not know, depend on Market	No	No	Feasibility study	No	Presonal Ideas	Market study	No	No	Yes	No

Note: The table summarises the responses of the eight outsider-based interviewees to questions related to decision-making and control procedure. **Key: CB**: Commercial Bank; **SB**: Specialised Bank; **A**: Academician; **CA**: Chartered Accountant; **Q**: Question; **Q7a**: How many stages do you think are in Libyan firm?; **Q7b**: How many stages do you think Libyan firms should have?; **Q7c**: Do you try to influence them to do so?; **Q8a**: Which of these stages do you think they are seen as most important and spend most time on?; **Q8b**: Which of these stages do you think they should be seen as important and spend most time on?; **Q8c**: Do you try to influence them to do so?; **Q9a**: Where do you think the ideas for an investment come from?; **Q8b:** Where do you think the ideas for an investment come from should come?; **Q9c**: Do you try to influence them to do so?; **Q10a**: Do you think they have a post audit phase? ; **Q10b**: Do you they should have a post audit phase?; **Q10c**: Do you try to influence them to do so? (for more details about questions see Appendix B).

Notwithstanding the latter, these results are consistent with the findings of some previous studies on this topic in developed countries (e.g. King 1975; Pinches 1982; Pike and Neale 2006). Interestingly, all the outsiders group (bankers, academics and chartered accountants) admitted that they did not know whether or not Libyan firms' capital investment decision-making processes were multi-stage in nature. For example, participant A1, the Head of a Finance and Banking Department in a Libyan University, suggested that if a number of stages existed in Libyan firms' capital investment decision-making procedures, they were externally-driven:

> *"These stages, if they exist in Libyan firms, exist because they are imposed by the funders or by regulatory authorities."* A1.

The outsiders were then asked if Libyan companies should recognise different stages in their capital investment decision-making process and, if so, how many should they have? Their answers to the first question were positive in 75 per cent of cases, with similar numbers and types of stages being mentioned to those identified by the firms themselves. The participants were then asked for their opinions about which stage(s) they believed to be the most important. Half of the outsider participants highlighted the implementation stage as the most important stage in current Libyan firms' practice. Most of the outsider interviewees identified the feasibility study stage as the stage which should be the most important stage in practice, while half of the outsider interviewees believed that the implementation stage should be the most important stage. Thus, again, the perception of Libyan managers and outsiders differed in terms of where managers' time and effort should be concentrated in practice.

The third question in this section related to sources of ideas for new capital investment projects. The participants argued that the main sources of ideas were those individuals (employees or investors) who were associated with the firm; market and political influences were rated second and third, respectively. In this respect, the Libyan evidence in this study is slightly different from that reported for developed countries in King (1975); and Pinches (1982); in these prior studies from the UK and US, respectively, more emphasis was placed on the market plan as a source of ideas for new capital investment ideas; political influences were rarely mentioned.

However, the importance of Government policy in triggering new investment opportunities within Libya is hardly surprising since, until recently, the whole economy was centrally-planned and controlled. Thus, a lot of business people looked at Government five-year plans when assessing which areas of the economy might grow and attract funding from the Central Bank. Another notable feature of the results is the fact that 50 per cent of the outsiders believed that Libyan firms would copy other firms' projects if these turned out to be successful and profitable. Thus, they suggested that there was a lack of innovation among Libyan firms when looking for project ideas. Outsiders believed that Libyan companies were caution and simply focussed on profitable ventures among competitors. In particular, the bankers, academics and chartered accountants suggested that there was a dearth of novel ideas for new investment such that a lot of investors focussed on examining activities which were currently successful; not surprisingly, profitable firms were targeted. However, all the outsiders believed that market research should be used as the proper source of ideas for new capital investment projects.

In response to the fourth question in this section of the interview, most of the managerial participants stated that their firms conducted regular follow-ups and ex-post audits of investments. However, they checked project performance for control purposes only and did not review earlier feasibility studies to learn from mistakes that had been made in the past. A previous study reported that more than half of the medium-sized firms in their sample often did not usually conduct any ex-post audit of capital investment (McIntyre and Coulthurst, 1985). Three of the eight outsiders believed that Libyan firms had a general follow-up phase in their investment decision-making, but not a formal ex-post audit process. This finding is not consistent with the evidence from developed countries where the percentage of firms conducting ex-post audits has been found to be higher than 50 per cent (Neale and Holmes, 1988; Neale and Buckley, 1992; Neale, 1995; Arnold and Hatzopoulos, 2000). Seven outsiders suggested that Libyan companies used evaluations of previous projects to obtain funding from banks. Thus, such studies were generally undertaken to justify future financial proposals and as an indication of a company's track record rather than as a tool for learning about how a company had performed. Outsider participants explained why they thought that Libyan companies did not conduct formal ex-post audits. For instance, A2 argued that:

> *"Firms do not use these studies for decision-making. Therefore, they do not care about these kinds of ex-post audits which require a comparison between the actual performance and the feasibility study."* A2.

Indeed, such a comparison might present a manager in an unfavourable light, which would be frowned upon in Libyan culture.

In terms of the influence of outsider groups, 50 per cent of the firm-based participants said that the strongest influence came from chartered accountants, while academics were ranked second; most managers indicated that accountants comment on investment expenditures when preparing and auditing the annual financial statements of their company; in these circumstances, they often offered opinions about the control of capital spending in order to maintain the liquidity of a company. In addition, if cost overruns had happened and capital spending was higher than expected, they often urged managers to compare actual outcomes with plans in order to identify the sources of any variances. However, amongst the interviewees from the outsider groups it was mainly the academics who claimed to try and influence companies to use a multi-staged capital investment decision-making process.

5.3.5 Capital Rationing

Table 5.7 summarises interviewees' responses to a number of questions regarding the issue of capital rationing. A majority (75 per cent) of the firm-based participants in the study said that their companies had experienced capital rationing in the recent past, while 87 per cent of outsiders perceived this to be the case. However, the results show that the interviewees experienced (in the case of firms) or perceived (outsiders) capital rationing as an externally driven phenomenon, in contrast to evidence from studies (of developed countries) which were highlighted in Chapter Two of this thesis (e.g. Pike, 1983; Trivoli and McDaniel, 1987; Mukherjee and Hingorani, 1999, Mukherjee et al., 2000). Published studies from the US and the UK suggest that funding is available for

capital projects, but management often impose limits on the amount of new investment which is undertaken during a given year as a form of control mechanism (Ross, 1986). For a centrally-planned economy such as that which existed in Libya at the time of the study, this rationing function seems to have been performed by the State. Various Government ministries decided upon which sector got funding and this depended on the political connections of the owners and the requirements of the most recent five-year plan. In addition, foreign currency was in scarce supply – especially during those years when sanctions were imposed on Libya by many countries throughout the world; if the capital expenditure involved the purchase of machinery or other assets from oversees, the Central Bank played a key role in sanctioning any such investment.

Table 5.7 shows that in cases where internal capital rationing did occur, the main reason why management imposed funding limits was to control the amount of debt which the firm took on. Firms set up constraints on their ability to borrow money in order to fund capital investment where gearing levels were a concern. Some firms also mentioned risk reduction as an additional reason for debt controls.

As Chapter 2 of this thesis indicated, Libya opened its first stock market in 2007. Even though it is still at an early stage of development, interviewees were asked about its potential role as a provider of capital for domestic firms. The participants' views were evenly split between those who did not see a role for the LSM in reducing external constraints on the funding available for companies and those who believed that the LSM had a positive role to play in easing any external restrictions on funding needs – but only in the long run.

Table 5.7: Capital Rationing.

	Q11	Q12	Q13	Q14
Insiders:			**Panel A: Companies**	
C1	Yes	Internal	Control debt and risk	No, maybe in long term.
C2	No	External	N/A	No, maybe in long term.
C3	Yes	Internal	Reduce the debt and reduce borrowing, to avoid the risk.	No
C4	Yes	External	N/A	No, maybe in long term.
C5	Yes	External	N/A	No
C6	Yes	External	N/A	No, maybe in long term.
C7	Yes	External	N/A	No
C8	Yes	Internal	Control the debt	Yes, but in long term
C9	Yes	External	N/A	No
C10	No	External	Control the debt by owners	Yes, but in long term
C11	Yes	Internal	Company Policy to control the debt and depend on self-funding	No, maybe in long term.
C12	No	Internal	Control the capital usage and the risk to make blance between the fiance and the income	No in our case, but it is positive factor to support the economic development in long term.
			Outsiders	
Panel B: Banks				
CB1	No	External	No	Yes, but in long term,
CB2	Yes	External	No	Yes, but in long term,
CB3	Yes	External	No	Yes, but in long term,
SB4	Yes	External	No	Yes, but in long term,
Panel C : Academics				
A1	Yes	Both	Control the Debt	Yes, but in long term
A2	Yes	External	No	Yes, but in long term
Panel D: Chartered Accountant				
CA1	Yes	External	No	Yes, but in long term
CA2	Yes	External	No	Yes, but in long term

Note: The table summarises of the twenty interviewees' responses to questions relating to capital rationing.**; Keys: C:** Companies; **CB:** Commercial Bank; **SB**: Specialised Bank; **A:** Academician; **CA:** Chartered Accountant; **B**: Banks; Q: Question (for more details about questions see Appendix B), Both: External and Internal; **Q11**: (for both groups) Has your firm (firms), have Libyan firms (outsiders) ever experienced a shortage of funding (Capital Rationing)?; **Q12**: (for both groups) Is any capital rationing internal or external?; **Q13: (**for both groups**)** If the rationing is imposed by management, why do you think that this occurs?; **Q14**: (for both groups) Do you think that the development of the Libyan Stock Market will help to alleviate the external restrictions on the funding?.

However, a closer inspection of the results suggests that, potentially worryingly for Libyan authorities, it was the outsiders who saw the potential role of the LSM; managers at only two firms thought that the LSM could help in funding investments. Several reasons for the negativity were expressed by the interviewees. For example, the lack of knowledge among Libyan firms about the functioning of the LSM, and the ways

in which they could take advantage of this opportunity in practice were expressed by those being interviewed.

5.3.6 Real Options (Flexibility) and Investment in AMT

The fourth part of the interview was designed to explore Libyan perceptions regarding two issues: the role of real options in the capital budgeting appraisal process and whether investment in (AMT) was evaluated differently from other types of capital spending. The section included three main questions as well as follow-ups for particular groups. The results, summarized in Table 5.7, indicate that 75 per cent of the firms considered real options, especially when evaluating whether an investment had any flexibility in terms of its timing, although options to abandon, change the scale and alter the nature of a project were also mentioned by the interviewees. All the outsiders believed that Libyan companies should consider real options when appraising capital investment projects although, again they did not try to influence the companies to behave in the desired manner. Similarly, they did not raise the issue with managers in terms of understanding the role of real options as a tool for enhancing flexibility within the firm and its role in reducing a firm's commitment to an investment in terms of the timing, scale and the nature of the project. This evidence is broadly consistent with the results from UK study by Busby and Pitts (1997), where different individuals were found to have a different understanding of what was meant by the term real options.

Table 5.8: Real Options (Flexibility) and Investing in AMT. (Part 1: Firms)

	Q15: Do tou consider realoptions when undertaking an investment? If so.,why?	Q16: When considering tliese options, do you. undertake any formal analysis or are they just used subjecthtly?	Q17: Does your firm plan to invest in Advanced Manufacturing Technology (AMT) in the future?	Q1S: Do yon use a specific appraisal technique and a specific source of funding for AMT investment?	Ql8d: Do the fiind providers accountant practitioners and/or academics attempt to influence you in these matters?
	Panel A: Companies				
C1	Yes, Flexbility	No	Yes, update technology	Yes	No
C2	Yes. Real Option (Abandon)	No	Yes, operation control, preventive maintenance tools.	Yes	No
C3	Yes, Flexibifity	No	Yes, all	Yes	No
C4	Yes, Flexibifity	No	Yes, all	No	Chartered Accountants
C5	Yes, Flexibifity	No. Technical study only	Yes	No, technical study only	No
C6	Yes, Flexibifity	No. restudy with use the same techniques	"Yes, new technology, Automated Material Handling	No	Chartered Accountants
C7	No, Flexibifity	No	No. nay be in future	Ido not lanow.	No
C8	Yes,Flexibifity	No. Subjectively	Yes, Automated Ma tenal Handling	Yes, Mos tly subj ectively	No
C9	Yes, Flexibility, change project nature	No	Yes, Quality Control systerm	No	No
C10	Yes. Flexbility, project scale	No. subjectively	No	1 think they should be different	No
C11	Flexibifity	No, subject h-ely	No	I think they should be different	No
C12	Flexibility	No, we restudy the project by using the sane techniques.	No	Yes, factors such as competition, quality and accuracy and reputaticn in the market and the competitive price play an important role in the long run. So they should be taken into account when we appraise that type of projects.	Chartered Accountants wit Options

Note: The table summarises the responses of the twelve firm-based interviewees to questions related to Real Options (Flexibility) & investing in AMT. **Key: C**: Companies; **Q**: Question (for more details about questions see Appendix B).

Table 5.8: Real Options (Flexibility) and Investing in AMT. (Part 2: Outsiders)

	Q15a	Q15b	Q15c	Q16a	Q16b	Q16c	Q17a	Q16b	Q17c	Q18a	Q18b	Q18c
Panel B: Banks												
CB1	N/A	Yes	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CB2	Yes, Flexibility	Yes	No	No	N/A	No	No	Yes	No	No	Yes	No
CB3	Yes, Flexibility	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No
SB4	Yes, Flexibility	Yes	No	N/A	Yes	No	Yes	Yes	No	N/A	Yes	No
Panel C : Academics												
A1	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	N/A	Yes	No
A2	N/A	Yes	No	No	No	No	N/A	Yes	Yes	N/A	N/A	No
Panel D: Chartered Accountants												
CA1	No	Yes	No	No	Yes	No	Yes	Yes	No	No	Yes	No
CA2	No	Yes	No	No	No	No	No	Yes	No	N/A	Yes	No

Note: The table summarises the responses of the twelve outsider-based interviewees to questions related to Real Options (Flexibility) & investing in AMT. **Key: C:** Companies; **CB:** Commercial Bank; **SB**: Specialised Bank; **A:** Academician; **CA:** Chartered Accountant; **B**: Banks; **Q**: Question; **Q15a:** Do you think Libyan firms consider the use of real options?; **Q15b**: Do you think Libyan firms should consider the use of real options when undertaking an investment**?; Q15c:** Do you try to influence them to do so?; **Q16a**: When they are considering these options, do you think they undertake any formal analysis or do consider these options subjectively?; **Q16b**: When they are considering these options, do you think they should undertake any formal analysis or should they consider these options subjectively?; **Q16c**: Do you try to influence them to do so?; **Q17a**: Do you know if Libyan firms have plans to invest in Advanced Manufacturing Technology (AMT) in the future?; **Q17b**: Do you think Libyan firms should invest in AMT in the future?; **Q17c**: Do you try to influence them to do so?; **Q18a**: Do you think that Libyan firms use a specific appraisal technique and a specific source of funding for AMT investment?; **Q18b**: Do you think Libyan firms should use a specific appraisal technique and a specific source of funding for AMT investment?; **Q18c**: Do you try to influence them to do so?; (for more details about questions see Appendix B).

While some mentioned the benefits of the flexibility which real options offered, others believed that real options could actually lessen a firm's commitment towards the project. Whilst there does appear to be widespread engagement with real options in the Libyan investment context, the firm-based participants also indicated that while they recognised the role of real options within a flexibility context, they did not undertake any further formal analysis of such options. Instead, they incorporated them subjectively into the investment decision-making process. In this way, the respondents in the current survey were no different from their counterparts in developed countries. For example, Busby and Pitts (1997) found that most of the 44 UK finance directors who responded to their postal survey used qualitative techniques to assess the magnitude of any real option which might be embedded within the investments that they evaluated. Four of the six outsiders who answered this question for the present study believed that companies should apply some form of objective analysis when evaluating any real options. However, once again, these outsiders claimed that they did not exhort firms themselves to undertake such an analysis. This finding is in line with evidence of other studies which shows that the usage of qualitative assessments and subjective methods to appraise real options is relatively common (Miller and Waller, 2003).

When asked about AMT, eight of the firm-based interviewees said that their companies had plans to invest in these types of projects. The types of AMT projects mentioned included automatic control systems, automatic handling systems and updates to existing technology. Amongst the outsiders, only two (one chartered Accountant (CA1) and one banker (SB4)) believed that Libyan firms were planning to invest in AMT, although all seven that answered the question argued that they should do. However, despite seven outsiders referring to the real competitive

advantages associated with spending on AMT, only the academics claimed to encourage firms to undertake such investments; by contrast, the managers believed that only the CAs played a role in supporting their decisions to invest in AMT.

Five (or 41 per cent) of the firm-based participants stated that they appraised investment in AMT using specific techniques and sources of funding. In particular, non-financial factors were prioritised for such investment and subjective methods of appraisal were more frequently used. Even those who employed financial appraisal methods for evaluating an investment in AMT claimed that they sometimes accepted a project that was not the best choice based on the financial criteria. For instance, participant C4, the CEO of a State-owned manufacturing company, said that a long payback period or a high cost that would normally mitigate against a project's acceptance could be overcome when assessing AMT expenditure. In this way, the respondents seemed to follow the appraisal process identified in a case study of Bonar Flotex plc. by Lonie et al. (1993); in this instance, the authors identified the importance of "strategic override" when evaluating AMT investments; the finding of conventional investment appraisal techniques were set aside if the strategic dimension of the proposed investment was important.

All six outsiders who had an opinion believed that Libyan firms should use context-specific analysis and funding when they appraised AMT projects. Despite holding these opinions, they did not encourage companies to undertake such analysis. Firms, in turn, felt no external pressure to evaluate AMT investment any differently from more conventional capital projects. This result is consistent with evidence from previous studies, such as Chan et al. (2001); these authors found that firms use one of two assessment approaches (economic or analytic / strategic) to appraise AMT investment. In an earlier investigation, Abdel-Kader and Dugdale

(1998) highlighted an increase in the use of the analytic and strategic approaches for evaluating AMT investment but not at the expense of conventional economic analysis. In practice, the firms tended to use a mixed approach (i.e. economic and strategic elements) to deal with the combination of conventional financial and intangible benefits offered by the AMT investments (Abdel-Kader and Dugdale, 1998).

5.4 Conclusion

This chapter has reviewed the results of the semi-structured interviews that were conducted with twelve firm-based individuals, four bankers, two academics and two accountants regarding investment appraisal in Libya. The discussion, which included nineteen questions divided into seven sections indicated several clear patterns among the views expressed by the Libyan participants; potentially one of the most significant of these is that the participants have a positive outlook regarding the impact of recent economic reforms[103].

Regarding the investment appraisal techniques, payback is the most popular appraisal technique among Libyan companies, although more than one method is normally used to appraise a new project. However, the usage of more sophisticated techniques such as DCF (e.g. NPV and IRR has increased, since earlier Libyan studies took place, suggesting that a trend documented in developed countries has begun to spread to the developing world. Importantly, the results also indicate that non-financial factors, such as political priorities, play an important role in the capital investment decision-making process in Libya.

[103] As acknowledged earlier, the research in this thesis took place just prior to the 2011 revolution. This issue is revisited in the next chapter.

In terms of selecting the cost of capital and calculating the discount rate, the interviews suggest that most of the Libyan firms included in the study decide on their cost of capital subjectively, with bank interest rates playing an important role in this process. Similarly, risk appears to be considered subjectively in most cases. Such a finding is surprising since academics and others suggested that managers should be familiar with quantitative measures for these aspects of capital budgeting. If familiarity with techniques is not the problem, then the political environment may have mitigated against their use.

In line with prior studies in the US and UK, Libyan firms recognised several phases in their capital investment decision-making procedure, with most suggesting that their firm followed a five-stage process; this usually ended with an ex-post audit phase as a regular follow-up to the completion of a project, albeit this was usually conducted in a severely restricted manner.

Most of the participants indicated that Libyan firms experience (mostly external) capital rationing; if the rationing was internally imposed, it usually reflected debt limits and/or risk concerns within a company. The participants pointed to a role for Islamic finance in alleviating any rationing, but expressed major reservations about the genuineness of existing Islamic products (less than the outsiders); they were no more convinced about the potential role of LSM in helping with investment needs.

Notwithstanding the evidence regarding the apparent subjectiveness inherent in the selection of discount rates and risk handling, the most striking evidence contained in this chapter relates to the difference in perceptions between Libyan firms and the various outsider interviewees. Whilst there appears to be a measure of consistency in what firms do and what those external to the organisation perceive

them to do, in most cases the latter's view regarding what *should* happen differed from practice. Perhaps of even more concern to those overseeing the corporate sector in Libya is that in very few cases did those involved (banks, CAs or academics) attempt to do anything to address the issue. The next chapter of the thesis summarises the results of the second phase of the study; the questionnaire survey used therein was influenced by this and the other main interview-based findings attained above.

Chapter Six

Questionnaire Results

6.1 Introduction

This chapter focuses on the perceptions of firms about investment appraisal issues in Libya. The chapter reports findings from a postal questionnaire that was administered between June and August 2010; thus, the analysis builds upon the evidence in the previous chapter by addressing the issues raised in the discussions, with a much larger sample of companies i.e. those most closely involved in the decision-making process in practice.

The chapter is divided into nine sections. The following section supplies details about the distribution of the questionnaire and the methods of data analysis employed, while the third section provides information about the sample. The fourth section presents the questionnaire results which relate to the capital investment techniques used by Libyan firms, before the fifth section details the risk assessment methods employed and the cost of capital calculations undertaken. The sixth section presents information about the stages that firms go through in their capital investment decision-making process; in particular, it examines the extent to which ex-post audits are carried out. The seventh section then provides information about the level of any capital rationing which occurs in Libya (and the role of LSM in relaxing this funding constraint on firms), while the eighth section covers Islamic finance and firms' perceptions about the potential of this rapidly growing type of finance. Section 6.9 supplies information about the influence of different outside groups on Libyan companies' capital budgeting decisions before the final section concludes the chapter by summarising the evidence and highlighting its key implications.

6.2 Questionnaire Method

As Chapter 4 highlighted, a questionnaire was designed to explore firms' perceptions of issues associated with the topic of capital investment in the context of the issues raised in the interviews with a broad, but much smaller group of interested parties. This instrument was used to survey 200 firms across five sectors of the economy namely: service firms (SF), manufacturing firms (MF), oil and gas firms (OG), companies in the food industry (FI) and financial firms (FF); forty companies from each sector were selected for inclusion in the final sample. It was difficult to select companies which satisfied this selection criterion as detailed statistics about the numbers of companies operating in Libya and the sectors in which they operate are difficult to obtain (Buferna, 2005). In addition, the embryonic state of the LSM meant that only a small number of the companies were listed, mainly from just one sector (banks).

The questionnaires were distributed personally by hand. It was impossible to send them by post because of the absence of a reliable postal service in Libya and, even though the questionnaire was personally delivered, a large number of companies refused to take part in the project and fill the instrument in. For this reason a final total of 97 questionnaires were finally distributed in the three largest cities throughout the country: the capital Tripoli, Benghazi (the second largest city) and Misrata. Only 45 of these 97 were collected and all were usable (giving a 46.4 per cent response rate).

These 45 questionnaires represent the viewpoints of 45 firms from five different economic sectors. The respondents firms' varied dramatically in terms of equity capital; the largest had a value of $10.18 billion while the smallest was worth only

$783,699. The statistical analysis began by examining the normality of the distribution of answers to each question and two tests were conducted: the Kolmogorov-Smirnov test and the Shapiro-Wilk test[104]. The results of these tests suggested that the data distributions were non-normal. For example, an analysis of the Kolmogorov-Smirnov tests revealed that 50 out of 53 variables were non-normal; with the Shapiro-Wilk tests, normality was rejected at the 5% level in 50 out of 53 cases tested (see Appendix C: Table 1).

Based on these results, a non-parametric test was used to examine differences in responses across the various groups. Specifically, the Kruskal-Wallis test statistic was employed to examine if there was a difference in response among the various sectors of the firms where the respondents worked and among the different size groups. The Mann-Whitney test was then employed to identify the specific pairs of sectors or groups where respondents' answers were significantly different from each other (see Appendix C Tables for more details about the Kruskal-Wallis and Mann-Whitney test results).

[104] The difference between the Shapiro-Wilk test of normality and the Kolmogorov-Smirnov test of normality is that the Shapiro-Wilk test is a specific test for normality, while the Kolmogorov-Smirnov test is broad-spectrum, but less powerful (Razali and Wah, 2011). Both tests take normality as the null hypothesis and establish a test statistic based on the sample, but they differ in terms of how they do so making them more or less sensitive to features of normal distributions. Shapiro-Wilk is often used when estimating departures from normality in samples of less than 50. This test was the first test that was able to detect differences from normality because of either skewness or kurtosis, or both (Althouse et al., 1998). Due to its good powerful properties, it became the preferred test (Mendes and Pala, 2003) in testing for normality. The Kolmogorov-Smirnov test can be used to test against any major distribution, whereas the Shapiro-Wilk is only for normality (Razali and Wah, 2011). Because the sample size in this study (45) is close to the limit of 50 for the Shaprio-Wilk test, the Kolmogorov-Smirnov test is used to confirm the conclusions from the first test.

6.3 The Profile of the Sample Respondents

Information on the background of both the participants and their companies was sought in the first section of the questionnaire. This data was asked for: because (i) it was thought useful in grouping the respondents; and (ii) because it might encourage participants to complete the questionnaire with more commitment (Sekaran and Bougie, 2009). Background details including the respondent's position within the firm's administration, their qualifications, the subject of their qualifications, the place of graduation, their years of experience in their current position, the sector in which their firm operates and the size of the firm's equity capital were obtained. Tables 6.1, 6.2 and 6.3 summarise this information, which itself was collected in Section A of the questionnaire.

Table 6.1 shows that the majority (96 per cent) of the respondents were in senior positions within their firms, and directly involved in the investment decision-making process. Most (96 per cent) were well educated, holding either a Bachelor's or Master's degree. For a sizeable majority of the sample (80 per cent) these degrees were in accounting, economics, finance, management or business administration. Thus, they should be familiar with the issues surrounding capital budgeting and aware of the terminology associated with investment appraisal; in short, they should have had no difficulties in answering the questions asked in this questionnaire[105]. Three quarters of the sample (74 per cent) got their degrees in Libya while 11% graduated from universities in the UK.

In terms of experience, the majority (80 per cent) had spent more than five years in their current positions. Such a finding is not unusual within Libya where

[105] Three quarters of the sample (74 per cent) got their degrees in Libya while 11% graduated from universities in the UK.

employees tend to remain with a firm for a substantial period of their working lives; movement between companies is not a frequent occurrence since most (medium to large sized) companies are all owned by the same employer i.e. the State (Buferna et al., 2005). This pattern is contrary to what is now found in many other emerging countries, such as those in East Asia; in Hong Kong, Malaysia, South Korea, Singapore, Taiwan and Thailand the majority of firms are owned primarily (and operated by) families (Xie, 2000; Glen and Singh, 2003). As a result, labour mobility in Libya is low since permission is needed to change management jobs from one State-owned company to another. In the current investigation, such a low level of labour mobility is an advantage since it ensures that a majority of the respondents were very knowledgeable about the organisations where they worked.

A visual inspection of Table 6.1 reveals that the sample of companies were drawn from five key economic sectors within the country: a third were from manufacturing firms while about a fifth were from the oil and gas sector as well as service firms and the remainder split evenly between the food industry and financial firms. These percentages are broadly in line with the overall industrial structure of the Libyan economy (AlObeidi, 1985; AlWakil, 2000). Thus, the findings should not be unique to a specific sector, but should apply instead to a broad range of companies within Libya. The spread of respondents' companies across the various sectors enables an analysis to be undertaken of how views regarding investment appraisal vary from one industry to another.

Finally, Table 6.1 reveals that the respondents worked across a broad cross-section of firm size. Whilst 44 per cent were from medium-sized firms, 29 per cent

Table 6.1 Sample Profile

		The Whole Sample		Sectors										Firm's Size Groups					
				SF		MF		OG		FI		FF		Small		Medium		Large	
Sample Size		**45**	**100%**	**9**	**20%**	**15**	**33%**	**10**	**22%**	**6**	**13%**	**5**	**11%**	**13**	**29%**	**20**	**44%**	**12**	**27%**
Position	CEO	**9**	**20%**	0	0%	4	27%	1	10%	3	50%	1	20%	4	31%	5	25%	0	0%
	CFO	**14**	**31%**	4	44%	5	33%	3	30%	1	17%	1	20%	2	15%	8	40%	4	33%
	Member of Board	**3**	**7%**	0	0%	0	0%	3	30%	0	0%	0	0%	0	0%	1	5%	2	17%
	Head of Department.	**17**	**38%**	4	44%	5	33%	3	30%	2	33%	3	60%	5	39%	6	30%	6	50%
	Other	**2**	**4%**	1	12%	1	7%	0	0%	0	0%	0	0%	2	15%	0	0%	0	0%
Qualification	Less than Bachelor	**2**	**4%**	0	0%	1	7%	1	10%	0	0%	0	0%	0	0%	0	0%	2	17%
	Bachelor	**28**	**63%**	7	78%	10	66%	2	20%	6	100%	3	60%	9	69%	12	60%	7	58%
	Masters	**15**	**33%**	2	22%	4	27%	7	70%	0	0%	2	40%	4	31%	8	40%	3	25%
Subject	Accounting	**27**	**60%**	4	44%	10	66%	8	80%	3	50%	2	40%	6	47%	11	55%	10	84%
	Economic & Finance	**5**	**11%**	2	22%	1	7%	1	10%	0	0%	1	20%	2	15%	3	15%	0	0%
	Management & Business	**4**	**9%**	2	22%	1	7%	0	0%	0	0%	1	20%	3	23%	0	0%	1	8%
	Engineering	**9**	**20%**	1	12%	3	20%	1	10%	3	50%	1	20%	2	15%	6	30%	1	8%
Place Of Graduation	Libya	**33**	**74%**	4	44%	15	100%	6	60%	6	100%	2	40%	8	61%	16	80%	9	75%
	UK	**5**	**11%**	2	22%	0	0%	2	20%	0	0%	1	20%	1	8%	2	10%	2	17%
	Egypt	**2**	**4%**	0	0%	0	0%	1	10%	0	0%	1	20%	0	0%	1	5%	1	8%
	Others	**5**	**11%**	3	34%	0	0%	1	10%	0	0%	1	20%	4	31%	1	5%	0	0%
Experience in Current Position	Less than 5 years	**9**	**20%**	2	22%	2	13%	4	40%	0	0%	1	20%	3	23%	2	10%	4	33%
	5-Less 15 years	**18**	**40%**	4	45%	7	47%	2	20%	3	50%	2	40%	7	54%	7	35%	4	33%
	15 years and Over	**18**	**40%**	3	33%	6	40%	4	40%	3	50%	2	40%	3	23%	11	55%	4	33%

Note: This table provides information about the sample: the position of the participant in the firm, qualification, subject, place of graduation and the experience in current position. Keys: SF= Services Firms; MF= Manufacturing Firms; OG= Oil & Gas Firms; FI= Food Industries; FF=Financial Firms; Head of Department: 5 Head of Accounting Department; 3 Head of Audit Department; 5 Head of Investment Department; 4 Planning & Projects & Feasibility Department.

worked in "small" and 27 per cent in "large" [106] companies. The views of respondents should not, therefore, be specific to any one size of company, but should instead highlight issues which are relevant to the range of companies that operate in the Libyan economy. Overall, Table 6.1 suggests that the sample has diversity in terms of its sector composition as well as the size profile, and the responses to the questionnaires reflect the opinions of people who have relevant background, experience and knowledge about the investment decision-making processes within their organisations. The results should therefore facilitate a meaningful comparison with the interview findings from the previous chapter.

Panel A of Table 6.2 provides various details about the main sources of funding used by the sample firms. An investigation of the table reveals that just under half (49 per cent) of the sample relied on only one source of finance to fund their existing capital projects; the rest (51 per cent) of the firms used more than one source of funding. Where only one source of funding was used, most (38 per cent) relied on Government bodies; such a finding is not surprising since, as Chapter Two pointed out, the Libyan economy was mainly centrally planned at the time of study[107] with most resources being allocated by the Government. Private financing on its own was discouraged for many years and has only recently been allowed by the authorities.

[106] As detailed in Chapter Four, small firms were defined as those with an equity share capital of less than $50m, medium firms were those with share capital of between $50m and $500m and the rest were deemed to be large.

[107] Moreover, central planning continues to be important as the post-Al-Gaddafi era takes shape (Almanara, 2013).

Table 6.2 Current and Future (Potential) Sources of Finance

	Whole Sample		Sectors					Firm's Size Groups		
			SF	MF	OG	FI	FF	Small	Medium	Large
Panel A: Current Main Source of Finance.										
1.Private-Funding	**1**	**2%**	0%	7%	0%	0%	0%	8%	0%	0%
2.Bank-Loan	**0**	**0%**	0%	0%	0%	0%	0%	0%	0%	0%
3.Government Bodies	**17**	**38%**	22%	40%	40%	66%	20%	46%	25%	50%
4.Shares	**4**	**9%**	22%	0%	0%	0%	40%	8%	15%	0%
5.Foreign Investor	**0**	**0%**	0%	0%	0%	0%	0%	0%	0%	0%
Two Sources: {4:(1,2); 6:(1,3); 1:(1,4)}	**11**	**24%**	34%	26%	20%	0%	40%	15%	30%	25%
Two Sources: {1:(2,3); 1:(2,4)}	**2**	**4%**	0%	7%	0%	17%	0%	8%	5%	0%
Two Sources: {4:(3,4); 3:(3,5)}	**7**	**16%**	22%	20%	20%	0%	0%	15%	15%	17%
Three Sources{1:(1,2,3); 1:(1,3,4); 1:(1,3,5)}	**3**	**7%**	0%	0%	20%	17%	0%	0%	10%	8%
Total	**45**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Panel B: The Existence of Potential Project(s) in Near Future.										
Firms have Potential Project in Near Future	**42**	**93%**	100%	87%	100%	83%	100%	100%	90%	92%
Firms do not have Potential Project in Near Future	**3**	**7%**	0%	13%	0%	17%	0%	0%	10%	8%
Total	**45**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Panel C: The Potential Source of Finance for Near Future project(s).										
1.Self-Funding	**6**	**14%**	22%	20%	13%	0%	0%	0%	24%	17%
2.Banks	**7**	**17%**	22%	7%	0%	33%	50%	15%	24%	8%
3.Government-Bodies	**6**	**14%**	11%	20%	0%	17%	25%	31%	6%	8%
4.Financial Market	**0**	**0%**	0%	0%	0%	0%	0%	0%	0%	0%
5.Foreign Investor(Partner)	**2**	**5%**	0%	7%	13%	0%	0%	0%	6%	8%
Two Sources {4:(1,2)}	**4**	**10%**	0%	20%	0%	17%	0%	23%	6%	0%
Two Sources {2:(2,3) ; 4:(2,5)}	**6**	**14%**	22%	7%	13%	17%	25%	15%	18%	8%
Two Sources {3:(3,5)}	**3**	**7%**	11%	7%	13%	0%	0%	8%	6%	8%
Three Source {2:(1,2,3),3:(1,2,5),1:(1,3,5),2:(2,3,5)}	**8**	**19%**	11%	13%	50%	17%	0%	8%	12%	42%
Total	**42**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: This table shows the current main source of finance and the potential source of finance if there are proposed projects in the near future. The Kruskal-Wallis's test conducted, which indicated there is no significant differences between the groups in each panel. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms.

Further, the stock market only began operating in 2007; as a result, the number of respondents' firms using this form of funding was relatively small. Not surprisingly, most of the respondents' companies used multiple sources of financing. For instance, 24 per cent of the firms used private funding in combination with bank loans, government grants and equity issues, while 7 per cent of firms employed three forms of financing.

A majority of the firms in the sample were optimistic about the pool of projects which they expected to fund in the near future; Panel B of Table 6.2 reveals that 93 per cent of the firms in the sample claimed to have new investments on the way. In some sectors (service, oil and gas, finance) this figure was as high as 100 per cent while, in the food sector, was only 85 per cent. The potential sources of finance for funding for these future projects did not differ dramatically according to the source of finance employed, although reliance on Government funding was forecast to be much lower: 14% rather than 38%, reflecting the changing political leadership in Libya[108]. In contrast, bank loans (17% versus 0%) were expected to be used more frequently[109] while foreign investment partners - currently absent – were mentioned by two of the respondents as a future source of finance.

These changes may be due to the privatisation policy adopted by the Libyan government since the mid-1990s (see Section 3.6.2) as well as new laws and regulations which have sought to rebuild the private sector and encourage investment

[108] When the multiple source categories were disaggregated, this trend was confirmed with 34 firms currently using Government funding but only 16 planning to do so in the future.

[109] Some 16 per cent planned to use them versus 13 who per cent currently did so when multiple sources have disaggregated.

by national as well as foreign investors (see Section 3.6.2). From Panel C of Table 6.2, it can be seen that, although most companies in the sample have potential projects which will require funding in the near future, none of them are considering an equity issue on the LSM. This finding may reflect a perception that the market is not sufficiently well developed (or too expensive) for the respondents' firms to seek a listing. Alternatively, there may be a dearth of general knowledge about how to use a stock market as a source of finance, because it is relatively new and most of the listed companies are currently banks.

6.4 The Usage of Appraisal Techniques

Table 6.3 reports the results for a question where respondents were asked to rank the importance of different investment appraisal criteria, with a "1" equating to completely unimportant and a "5" to very important. Panel A reports the results for the various financial criteria while Panel B documents the findings for non-financial criteria. Specifically, the first four columns list the criteria, the number of respondents selecting that criteria, the rating attaching to the criteria and a ranking based on the mean scores. The middle five columns of the table disaggregate the overall mean ratings according to the sector where the respondents' companies worked, while the final three columns split the means according to firm size.

A number of points emerge from a visual inspection of the data in Table 6.3. Payback (PB) is the most important technique according to the respondents (with a mean of 4.364); in fact, it was the best-known technique among those answering the

questionnaire since it was selected by 98 per cent of the sample. The profitability index (PI) is ranked second in terms of importance (with a mean of 4.320), but is only sixth in terms of popularity (it was only selected by 56 per cent of the sample as important). Thus, the small majority who indicated that PI was important gave it a very high rating in the questionnaire. The internal rate of return (IRR) and net present value (NPV) were ranked in third and fourth place, respectively, (with means of 4.303 and 4.056); however, in popularity terms the NPV was second and IRR third.

Second, when the responses to this question were split according to the sector of the company where the respondent worked, a number of differences emerged. For example, the PI was most popular among manufacturing firms while the ARR was associated with the highest mean among financial firms; thus, there is some evidence that the importance of different investment appraisal criteria varies from one sector to another. In addition, the overall mean rating values given to the different appraisal methods vary among the industries. For example, the highest ranking was 4.887 where respondents' firms operated in the services sector while the highest ranking was only 4.444 for firms in the financial sector. Overall means, reflecting the combined use of all techniques, ranged from 3.938 to 4.384 suggesting that all the appraisal techniques were used to some extent since the average scores were closer to '5' than '1'.

Table 6.3 Importance of Financial and Non-Financial Criteria in the Investment Appraisal Process.

				Sectors					Firms Size Groups		
				SF	MF	OG	FI	FF	Small	Medium	Large
	Number (%)	Mean (P-Value)	Mean Rank	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)
Panel A: Financial Criteria											
PB	44 (98%)	**4.364 (0.00)**	**1**	4.111 (0.01)	4.467 (0.00)	4.111 (0.01)	4.833 (0.00)	4.400 (0.01)	4.538 (0.00)	4.300 (0.00)	4.273 (0.00)
PI	25 (56%)	**4.320 (0.00)**	**2**	4.857 (0.00)	4.200 (0.00)	4.200 (0.03)	0.000 ……	3.667 (0.18)	4.500 (0.00)	4.273 (0.00)	4.250 (0.00)
IRR	33 73%	**4.303 (0.00)**	**3**	4.571 (0.00)	4.077 (0.01)	4.429 (0.00)	4.000 …….	4.400 (0.03)	4.556 (0.00)	4.133 (0.00)	4.333 (0.00)
NPV	36 (80%)	**4.056 (0.00)**	**4**	4.000 (0.00)	3.923 (0.01)	4.625 (0.00)	3.000 ……	4.000 (0.18)	4.111 (0.01)	3.824 (0.01)	4.400 (0.00)
MIRR	27 (60%)	**3.963 (0.00)**	**5**	4.000 (0.00)	3.750 (0.11)	4.000 (0.01)	5.000 ……	4.000 (0.23)	4.571 (0.00)	3.550 (0.11)	4.000 (0.00)
ARR	31 (69%)	**3.839 (0.00)**	**6**	3.222 (0.45)	4.200 (0.00)	4.000 (0.02)	4.333 (0.06)	4.444 (0.50)	3.778 (0.02)	3.583 (0.03)	4.200 (0.00)
DPB	24 (53%)	**3.583 (0.00)**	**7**	3.125 (0.73)	3.571 (0.10)	4.167 (0.00)	0.000 ……	3.667 (0.18)	3.667 (0.10)	3.200 (0.51)	4.000 (0.00)
Other	2 (04%)	**5.000 …….**	**…….**	5.000 …..	5.000 …..	0.000 ……	0.000 ……	0.000 ……	5.000 …….	0.000 …….	0.000 ……
Financial Criteria Mean		**4.099 0.00**		**3.966** (0.00)	**3.938** (0.00)	**4.229** (0.00)	**4.384** (0.00)	**4.116** (0.00)	**4.295** (0.00)	**3.896** (0.00)	**4.215** (0.00)
Panel B: Non-Financial Criteria											
PP	42 (93%)	**4.620 (0.00)**	**1**	4.444 (0.00)	4.846 (0.00)	4.400 (0.00)	5.000 …..	4.250 (0.08)	4.636 (0.00)	4.632 (0.00)	4.583 (0.00)
SDP	42 (93%)	**4.600 (0.00)**	**2**	4.556 0.00	4.643 0.00	4.600 0.00	4.750 0.01	4.400 0.01	4.364 0.00	4.632 0.00	4.750 0.00
PEx	39 (87%)	**4.150 0.00**	**3**	4.222 (0.00)	4.000 (0.01)	3.889 (0.02)	4.833 (0.00)	4.000 (0.23)	4.455 (0.00)	4.235 (0.00)	3.727 (0.05)
SEF	37 (82%)	**4.000 (0.00)**	**4**	4.444 (0.00)	3.900 (0.04)	3.333 (0.35)	5.000 ……	3.800 (0.10)	3.889 (0.00)	4.294 (0.00)	3.636 (0.07)
CB	33 (73%)	**3.760 (0.00)**	**5**	4.222 (0.00)	4.000 (0.03)	3.889 (1.00)	4.833 (0.50)	4.000 (0.23)	4.455 (0.01)	4.235 (0.06)	3.727 (0.11)
LR	1 (02%)	**5.000 ……..**	**……**	0.000 (0.00)	5.000 ……	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	5.000 …….	0.000 (0.00)	0.000 (0.00)
Non-Financial Criteria Mean		**4.259 (0.00)**		**4.377** (0.00)	**4.311** (0.00)	**4.043** (0.00)	**4.884** (0.00)	**4.100** (0.00)	**4.389** (0.00)	**4.416** (0.00)	**4.105** (0.00)

Note: This table answers research question number 1(a,b), it shows the mean and the t-test P-value of the importance of each of the Financial and Non-Financial Criteria in investment appraising process of the firms in the sample. A 5-point scale was used in this question "1=Completely Unimportant, 2=Unimportant, 3=Neutral, 4=Important and 5=Very Important.". Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; PB: Payback; PI: Profitability Index; IRR: Internal Rate of Return; NPV: Net Present Value; MIRR: Modified IRR; ARR: Accounting Rate of Return; DPB: Discounted PB; Others: 1 Break-even Analysis, 1 SWOT analysis; PP: Political Priorities; SDP: State Development Plan; PEx: Personal Experience; SEF: Social & Environmental Factors; CB: Competitor Behaviour; LR: Laws & Regulations. t-test P-Value < 0.05 indicates the mean is significantly different from the neutral position (3); 1:completely unimportant; 2:unimportant; 4:important; 5:very important.

Third, there was also variation in the mean score for different appraisal techniques across the size of the firms where the respondents worked. Those who worked in large companies rated NPV as the most important method while respondents in small companies indicated that MIRR was the most important. Similar questions to company representatives in other countries have suggested that the PB method is most important, particularly amongst small firms, where overall falls in its popularity over the last 20 years have not been as dramatic as for larger organisations (Pike, 1996; Arnold and Hatzopoulos, 2000; Eljelly and AbuIdris, 2001; Khamees et al., 2010).

Fourth, a number of the non-financial criteria were rated highly by the respondents, as is evident in Panel B of Table 6.3. Panel B presents mean scores for the importance of the non-financial criteria and p-values for the test of the null hypothesis that the mean score is equal to the neutral value of 3.000. Not surprisingly given the structure of Libya during Al-Gaddafi's in charge, political priorities (PP) were placed first, indicating the dominance of this factor (with a mean 4.620) when evaluating investments. Compatibility with the State Development Plan (SDP) was rated second (with a mean of 4.600), while personal experience was placed third (with a mean of 4.150). Again, there were differences in the ranking of the non-financial criteria among the respondents across both sectors and company size groups. Specifically, political priorities were rated the most important non-financial factor by those who worked in the manufacturing sector, while the SDP was ranked first by service, oil and gas and financial firms. Similarly, respondents from large firms highlighted compatibility with the SDP as the most important non-

financial factor while those who worked in smaller firms rated political priorities and previous experience first and second, respectively. At the other end of the rankings, respondents in small firms gave the "Social and Environmental" factor the lowest mean score while their counterparts in large companies selected 'Competition Behaviours' as the least important non-financial factor among those that were selected.

Fifth, a comparison of the two panels (A and B) reveals that the non-financial criteria appear to be more important than the financial criteria according to the respondents; the overall average for the non-financial criteria was 4.259 while the overall mean score for the financial criteria was 4.099. In fact, the first three non-financial criteria (PP, SDP, PEx) were selected by more than 85 per cent of the sample with the first two of these criteria (Political Priorities and the State Development Plan) generating average scores that were 4.600 or above[110].

These results are consistent with findings emerging from other recent studies which have suggested that non-financial criteria playing a more important role in firms' capital investment processes (Hall and Millard, 2010). The influence of non-financial factors has been put forward as reflecting firms' investment strategies and/or competitive behaviour (Harris, 2000), which would suggest that Libyan firms have not been insulated from global developments in these areas.

Sixth, a visual inspection of Table 6.3 indicates that the null hypothesis that the mean ranking is not different from the neutral score of 3 can be rejected for a sizable

[110] This is not surprising in a State such as Libya i.e. a totalitarian system based on a socialist ideology.

number of both the financial and non-financial criteria for the whole sample; all of the variables apart from "Other" (in the financial criteria) and "Laws and Regulations" (in non-financial criteria) have p-values less than 0.05. An analysis of the significance levels for the financial criteria responses across the different sectors reveals that 20 of the 40 means are significant, as are 20 out of 30 for the non-financial criteria.

Some 17 of the significant rankings in the former case are in the Services, Manufacturing and Oil and Gas sectors; the relatively small number of rejections for the null in the Finance and Food Industries may have been due to the small number of responses in these groups. A similar inter-industry picture emerges with the rankings for the non-financial criteria considered[111].

Of course, there are other factors that may have an impact on the type of technique or combination of techniques used in the appraisal of a project; variables such as the size of the potential project, the source of funding and the nature of the project (innovation, new production line or extension to an existing production line) may influence the appraisal technique employed. Therefore, Table 6.4 documents the responses to questions concerning these issues; the mean scores are provided as well as the p-value for tests of the null hypothesis that the average ranking is equal to the neutral score of 3.000. As can be seen from Table of 6.4, the source of funding was identified as the most important of these factors when determining which

[111] Regarding the comparison of economic sector and size, there were very few statistically significant differences between them, except for the size groups in relation to the modified internal rate of return (MIRR): the small companies placed significantly more importance on MIRR than did the large or medium-size companies, (see Appendix C, Table 2). With regard to non-financial criteria, there were no differences between size groups. However, there were differences regarding the social and environmental factors across economic sectors (see Appendix C, Table 3).

investment appraisal technique would be used to evaluate a project; the mean response was 4.700 and its importance was acknowledged by 98 per cent of the sample.

Project size was ranked second (with a mean of 4.200). A disaggregated analysis of the results by economic sector and company size revealed no significant differences among the respondents (see Appendix C, Table 4); in fact, Source of Funding, Size and Nature of Investment were all ranked as important by each sectorial and size-based sub-group[112].

Table 6.4 Importance of Project Features in Determining the Technique (or Combination of Techniques) used in Investment Appraisal.

Project Features				Sectors					Firms Size Groups		
				SF	MF	OG	FI	FF	Small	Medium	Large
	Number	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
	%	(P-Value)	Rank	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)
Source of Funding	44	**4.700**	**1**	4.778	4.643	4.700	5.000	4.400	4.667	4.800	4.583
	(98%)	**(0.00)**		(0.00)	(0.00)	(0.00)	…..	(0.03)	(0.00)	(0.00)	(0.00)
Size	45	**4.200**	**2**	4.222	4.200	4.400	3.833	4.200	4.000	4.200	4.417
	(100%)	**(0.00)**		(0.01)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Nature	41	**4.150**	**3**	4.556	4.167	4.000	3.600	4.200	3.917	4.235	4.250
	(91%)	**(0.00)**		(0.00)	(0.00)	(0.00)	(0.21)	(0.00)	(0.01)	(0.00)	(0.00)
Timing	1	**5.000**	**4**	……..	…….	5.000	……..	……	……	5.000	……
	(02%)	**…..**		……	……	……	…..	……	……	……	……
Total Mean	**45**	**4.358**		**4.519**	**4.342**	**4.387**	**4.176**	**4.267**	**4.189**	**4.431**	**4.417**
	(100%)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: This table shows the mean and the t-test P-value for responses relating to the importance of project features in determining. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms. t-test P-Value < 0.05 indicates the mean is significantly different from the neutral position (3)); 1:completely unimportant; 2:unimportant; 4:important; 5:very important.

A comparison of the means reveals that the source of funding was seen as less important by respondents in the "large" firm group than by others, presumably

[112] There is one exception to this generalisation – Nature of project in the Food Industry was not rated as important since it only had a mean score of 3.600 and the p-value indicates that it is not statistically significant.

because they had access to sizeable amounts of internally-generated cash flows. By contrast, respondents in smaller companies rated the nature of the investment a less important influence on the appraisal technique used than those in their larger-sized counterparts.

6.5 Risk

Respondents were asked a number of questions about how risk is incorporated into their firm‘s investment appraisal processes. Responses to a simple question about whether risk was assessed in relation to investments are summarised in Panel A of Table 6.5. The figures indicate that the vast majority (82 per cent) of the respondents’ firms did indeed assess the risks of future investment projects. Only 8 of the 45 respondents indicated that their firms did not consider risk. Surprisingly, large firms were the most likely to respond “no” in this case; previous studies in developed countries have suggested that risk analysis is primarily performed by large companies (Ho and Pike, 1991). However, for the current sample, only 8 per cent of smallest firms indicated that no risk assessment was undertaken. This suggests that, in so far as risk is concerned, generalising developed country-based results to developing state-driven economies such as Libya may not be empirically justifiable. Twenty per cent of respondents from companies in the Oil and Gas sector claimed not to evaluate the risk of an investment, yet most of the substantive literature suggests that large firms, such as those that operate in the oil and gas sector in Libya, employ sophisticated methods for evaluating the risk of capital spending because of

the large expenditures involved (Pike, 1988). Perhaps these 20 per cent of respondents in the current sample worked in firms which collaborated with multinational companies who undertook the risk analysis on their behalf.

Panel B of Table 6.5 shows the mean response for various risk assessment methods based on the usual Likert scale of 1 "completely unimportant" to 5 "Very important", with p-values shown for a test of the null hypothesis that the mean score is different from the neutral value of 3.000. The rank of these means shows that the most important risk assessment method employed by respondents' firms is break-even analysis (BEA), where a significant mean of 4.120 was recorded. Shortening the payback period (SPB) was ranked second, with a mean of 4.040. In third place, two methods were ranked equally: raising the required rate of return (RRR) and sensitivity analysis (SEN); both had means of 3.950.

Overall the responses suggest that firms tend to attach more importance to the simpler, less sophisticated methods. More theoretically justifiable approaches such as Beta analysis (mean = 2.62) were not rated as important. An analysis of the number of firms which mentioned the subjective responses to risk revealed that subjective assessment was rated as being important to some degree having been selected by the largest proportion (67 per cent) of the sample; shortening the PB period and scenario analysis were joint second, both being chosen by 53 per cent of the sample.

Table 6.5 Risk Assessment

Panel A: Do Firms Assess Risk?										
Risk Assessment	Whole Sample		Sectors					Firm's Size Groups		
			SF	MF	OG	FI	FF	Small	Medium	Large
Yes	37	82%	67%	87%	80%	83%	100%	92%	85%	67%
No	8	18%	33%	13%	20%	17%	0%	8%	15%	33%
Total	45	100%	100%	100%	100%	100%	100%	100%	100%	100%

Panel B: The Importance of Individual Risk Assessment Methods.											
Assessment Methods				Sectors					Firm's Size Groups		
				SF	MF	OG	FI	FF	Small	Medium	Large
	Number %	Mean (P-Value)	Mean Rank	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)	Mean (P-Value)
BEA	16 (36%)	4.120 (0.00)	1	4.500 (0.21)	4.500 (0.01)	4.000 (0.00)	0.000 (0.00)	3.667 (0.50)	4.000 (0.09)	4.333 (0.00)	4.000 (0.01)
SPB	24 (53%)	4.040 (0.00)	2	4.333 (0.00)	3.857 (0.17)	4.143 (0.03)	4.000 ……	3.667 (0.18)	4.000 ……	3.917 (0.02)	4.286 (0.02)
RRR	19 (42%)	3.950 (0.00)	3	4.200 (0.07)	3.250 (0.76)	4.167 (0.00)	0.000 (0.00)	4.000 (0.09)	3.333 (0.42)	4.000 (0.03)	4.167 (0.00)
SEN	22 (49%)	3.950 (0.00)	3	4.800 (0.00)	3.714 (0.18)	3.500 (0.36)	0.000 (0.00)	4.000 (0.18)	4.800 (0.00)	4.273 (0.00)	2.667 (0.47)
SCE	24 (53%)	3.830 (0.00)	5	4.500 (0.01)	3.143 (0.81)	4.000 (0.00)	4.000 ……	4.000 (0.09)	4.200 (0.00)	4.000 (0.02)	3.375 (0.29)
SUB	30 (67%)	3.730 (0.00)	6	2.750 (0.72)	4.273 (0.00)	3.000 (1.00)	4.250 (0.02)	4.000 ……	3.889 (0.05)	3.857 (0.00)	3.286 (0.46)
SIM	16 (36%)	3.120 (0.72)	7	3.667 (0.42)	2.000 (0.39)	3.571 (0.17)	0.000 (0.00)	3.000 ……	3.667 (0.42)	3.429 (0.45)	2.500 (0.42)
DTA	13 (29%)	3.080 (0.72)	8	4.000 (0.50)	2.667 (0.42)	3.000 (1.00)	0.000 (0.00)	3.000 ……..	3.667 (0.42)	3.000 …….…	2.833 (0.61)
BET	13 (29%)	2.620 (0.21)	9	4.000 (0.50)	1.667 (0.18)	2.667 (0.17)	0.000 (0.00)	2.500 ……..	4.000 (0.50)	2.400 (0.21)	2.333 (0.10)
Other	1 (2%)	5.000 ……..	……..	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	5.000 ……..	0.000 (0.00)	5.000 ……..	0.000 (0.00)
Total Mean	37 (100%)	3.695 (0.00)		4.121 (0.00)	3.480 (0.00)	3.583 (0.00)	4.167 (0.00)	3.724 (0.00)	4.000 (0.00)	3.840 (0.00)	3.293 (0.00)

Note: This table summarises responses to questions relating to risk assessment methods. In Panel B, the mean and the P-value relate to a test of mean response being equal to 3 where 1= completely unimportant; 2= unimportant; 4= important; 5= very important. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; BEA: Break-even Analysis; SPB: Shorten the PB period; RRR: Rising Req. Rate of Return; SEN: Sensitivity Analysis; SCE: Scenario Analysis; SUB: Subjective Assessment; SIM: Simulation (Monte Carlo); DTA: Decision Tree Analysis; BET: Beta Analysis; Others: SWOT analysis.

Respondents in small and medium sized firms considered SEN as a particularly important method of assessing risk (means of 4.800 and 4.273, respectively) while their counterparts in large sized firms were more equivocal about the role of SEN in this area (mean = 2.667). Thus, there is an apparently inverse relationship between firm size and the importance of SEN; as the size of the firm increased respondents suggested that the importance of SEN fell.

A sectorial analysis of the responses reveals that those from the Services firms (SF) and Oil and Gas (OG) industries were equivocal about the importance of subjective assessment (SUB) as a method for gauging risk in capital budgeting; for SF the mean was 2.750 with a p-value 0.72, while for OG the mean was 3.000 with a p-value 1.00. By contrast, respondents in the other three sectors rated SUB as an important method for appraising the risk of an investment; in manufacturing firms the mean was 4.273, in the food industry the mean was 4.250 and in financial firms the mean was 4.000. While the pattern of the findings suggests that as per previous Libyan studies by AlObeidi (1985) and AlWakil (2000), the majority of Libyan firms evaluate risk subjectively, the broader picture to emerge from Table 6.5 is very different from the earlier finding of little or no evaluation of risk in Libya; and any risk analysis that was performed according to earlier investigations usually involved a more subjectively-based approach.

Inspection of Table 5 in Appendix C shows that, apart from sensitivity analysis (SEN)[113] and subjective assessment (SUB)[114], there are no statistically significant

[113] Based on the Kruskal-Wallis statistic, the p-value of the null that there were no differences in responses between the size groups was rejected for SEN at the 95 per cent level (p-value 0.01). The result of the Mann-Whitney Mean test reveals that small and medium sized firms tend to give a higher

differences between the responses across economic sectors or size groups. Thus, there was a great deal of uniformity among the respondents' firms about how risk was assessed. Such a finding is not surprising given the context within which most firms operated. With a lot of the investment being State-sanctioned, the scope for variety among approaches to risk assessment was probably limited.

Table 6.6 provides information about views regarding the cost of capital employed by respondents' firms and the methods used to calculate it. Panel A of the table shows the results for a simple "Yes/No" question regarding the calculation of the cost of capital of firms. Inspection of this panel reveals that 50 per cent of the 44 respondents claimed that their firms estimated a cost of capital. However; this practice was not uniform across the different sectors, while only a third of firms in the SF sector calculated the cost of capital, 60 per cent of those in the OG industry and 40 per cent in the FF sector did note their companies evaluating the figure[115].

Such a finding is surprising given the results in Table 6.4 which highlighted the importance attaching to DCF techniques among the respondents' firms; PI, IRR, NPV and MIRR were rated 2nd, 3rd, 4th and 5th in terms of overall performance and all require knowledge of the cost of capital. What is less surprising is the finding that the cost of capital is calculated most in those sectors which are capital intensive (e.g.

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level of importance to the usage of the Sensitivity Analysis technique while the large sized firms give less importance.

[114] The Kruskal-Wallis test indicates a significant difference between economic sectors regarding the Subjective treatment of risk. The Mann-Whitney Mean test result reveals that Service Firms and Oil and Gas firms tend not to rely on Subjective treatments of risk, while Manufacturing firms, Food Industry firms and Financial firms rely more on subjective ways to incorporate risk in their investment appraisal processes.

[115] The extent of statistical differences across sectors is detailed in Appendix 6.6.

Oil and Gas); however, even here a sizeable minority of companies apparently do not know what their cost of capital is since the figure is not determined.

Table 6.6 Responses to Questions relating to the Cost of capital

Cost of Capital	Whole Sample		Sectors					Firm's Size Groups		
			SF	MF	OG	FI	FF	Small	Medium	Large
Panel A: Firms calculating cost of capital.										
Yes	22	50%	33%	53%	60%	50%	40%	31%	60%	55%
No	22	50%	67%	47%	40%	50%	60%	69%	40%	45%
Total	44	100%	100%	100%	100%	100%	100%	100%	100%	100%
Panel B: The Method(s) used to calculate the Cost of Capital (Discount rate).										
1.Capital Asset Pricing Model (CAPM) / Weighted Average Cost of Capital (WACC).	4	18%	33%	0%	17%	0%	100%	0%	33%	0%
2.Subjective Judgement.	6	27%	33%	25%	33%	33%	0%	25%	25%	33%
3. Dividend Growth Model.	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
4.Risk-free Rate / Cost of debt (Interest rate).	4	18%	0%	0%	33%	67%	0%	0%	8%	50%
5.Set by the Owner.	1	5%	0%	13%	0%	0%	0%	0%	8%	0%
Two Methods {1:(1,2); 1:(1,3); 2:(1,4)}.	4	18%	33%	38%	0%	0%	0%	25%	25%	0%
Three Methods {2:(1,3,4); 1:(2,3,4)}.	3	14%	0%	25%	17%	0%	0%	50%	0%	17%
Total	22	100%	100%	100%	100%	100%	100%	100%	100%	100%
Panel C: The Method(s) Separately.										
1.Capital Asset Pricing Model (CAPM) / Weighted Average Cost of Capital (WACC).	10	45%	67%	50%	33%	0%	100%	75%	58%	0%
2.Subjective Judgement.	8	36%	33%	50%	33%	33%	0%	50%	25%	50%
3. Dividend Growth Model.	4	18%	33%	25%	17%	0%	0%	50%	8%	17%
4.Risk-free Rate / Cost of debt (Interest rate).	9	41%	0%	50%	50%	67%	0%	50%	25%	67%
5.Set by the Owner.	1	5%	0%	13%	0%	0%	0%	0%	8%	0%

Note: This table details responses indicating whether or not firms calculate the cost of capital (discount rate) and if the answer is yes, which method is used. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms. t-test P-Value < 0.05 indicates the mean is significantly different from the neutral position (3); 1:completely unimportant; 2:unimportant; 4:important; 5:very important.

Panel B of Table 6.6 relates to the methods used in the 22 cases where respondents indicated that the cost of capital was calculated. A majority (68 per cent) of the respondents' firms used only one method to calculate their cost of capital, while the remainder (32 per cent) used two or three methods when estimating

this figure. Amongst the former group, 'Subjective Judgment' was the most popular, with 6 firms using it. Panel C of the Table presents an analysis of the responses in terms of method i.e. when the multiple method cases are separated out. The most-used method in this case is the capital asset pricing model (CAPM)/weighted average cost of capital (WACC) (45 per cent of the firms), followed by risk-free rate/ cost of debt 'interest rate' (41 per cent of the firms), and subjective judgement (36 per cent of the firms). Therefore, in terms of sophistication level, relatively less sophisticated methods are clearly used more than the classic CAPM/WACC-based form of analysis. Such a finding was not unexpected give the attractiveness of relatively simple approaches for estimating the cost of capital. However, the number indicating that the CAPM/WACC is used could be regarded as being more surprising given Libya's lack of economic development and Government dominance of financing. The levels of sophistication evident amongst a large minority of respondents may reflect their advanced educational backgrounds and global awareness of advanced methods of risk assessment[116].

In terms of employing different discount rates when appraising different investments, only 9 per cent of the respondents in the sample stated that they acted in such a way. However, those that did indicated three reasons for this practice: (i) their firms wanted to use methods appropriate for project-specific conditions; (ii) their firms wanted to incorporate the time value of money in as easy a way as possible;

[116] The answers summarised in Panel B and Panel C were compared across economic sectors and size groups but there were no statistically significant differences in the usage of the various methods (for more details see Appendix C, Table 6).

and (iii) their firms wanted to reflect changes in interest rates (see Appendix C, Table 7 for more details about this evidence).

6.6 Stages

The fourth section of the questionnaire contained three questions relating to the various stages that make up the investment decision-making process. According to the substantive literature (e.g. King, 1975; Pinches, 1982; Pike and Neale, 2006; Arnold, 2008), the investment decision-process can be broken down into a number of stages, from idea formulation to ex-post audit of the investment. The questionnaire sought respondents' views on the extent to which the five stages most commonly mentioned in the literature were present in their firms. Table 6.7 summarises the responses. An analysis of the table shows that the monitoring and control stage (mean of 4.530) was rated most important while the determination of the budget and authorisation stages came in joint second place (means of 4.460). The evaluation stage came in third place (mean of 4.420), while the research and development stage came in fourth, with a mean of 4.120.

To an extent, these results mirror findings from developed countries such as the UK. British studies by King (1975) and Mclntyre and Coulthurst (1985) highlighted the equal (or even greater) importance of evaluation and monitoring/control of capital expenditures than the formal decision stage. The authors attributed the over-emphasis on evaluation to 'traditional' financial education in general and financial textbooks in particular. Specifically, it is argued that education using 'conventional'

Table 6.7 The Importance of Individual Stages in the Investment

Decision-Making Process

Stages				Sectors					Firm's Size Groups		
				SF	MF	OG	FI	FF	Small	Mediu	Large
	Numbe	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
	%	(P-Value)	Rank	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)
1. Determination of the	41	4.460	2	4.444	4.429	4.500	4.250	4.750	4.167	4.706	4.417
Budget	(91%)	(0.00)		(0.00)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)
2. Research &	34	4.120	4	4.444	4.083	3.667	5.000	4.333	4.400	4.462	3.455
Development	(76%)	(0.00)		(0.00)	(0.00)	(0.08)	…….	(0.06)	(0.00)	(0.00)	(0.05)
3. Evaluation	45	4.420	3	4.889	4.400	4.100	4.167	4.600	4.385	4.550	4.250
	(100%)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
4. Authorisation	41	4.460	2	4.500	4.500	4.333	4.600	4.400	4.750	4.412	4.250
	(91%)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
5. Monitoring &	38	4.530	1	4.500	4.500	4.750	4.200	4.667	4.700	4.375	4.583
Control	(84%)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)
Total Mean		4.406		4.558	4.391	4.261	4.333	4.550	4.474	4.506	4.203
		(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: This table related to answers concerning research question number three (a and b). It shows the importance of each of five stages in the firm's investment appraisal process. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; Number: number of response; t-test P-Value < 0.05 indicates the mean is significantly different from the neutral position (3); 1:completely unimportant; 2:unimportant; 4:important; 5:very important.

financial management textbooks devotes virtually all of their time to the detailed analysis of 'conventional' appraisal techniques such as NPV and IRR. Within a Libyan context, the same arguments can be advanced since most Universities use US or UK textbooks (Kilani, 1988; Mahmud, 1997) and a sizeable number of the academics are educated abroad; therefore, not surprisingly, the emphasis will tend to be the same as in developed countries which typically supply the education. The centrally-planned nature of the Libyan economy almost certainly adds to the focus on monitoring and control evident in Table 6.7. Any funds provided by the State presumably need to be accounted for; the high mean ranking given to the authorisation stage would also tend to support this view.

In such a context, it is hardly surprising that the research and development stage is ranked only fourth since most ideas will not emanate from thoughts generated at the firm level but will instead emerge once the State plan has been published and Government priorities set. A further investigation of the responses reveals that the evaluation stage was the most popular, with 100 per cent of the sample acknowledging its existence. The determination of the budget stage and the authorisation stage were also apparently prevalent among respondents' firms since they were both selected by 91 per cent of the sample. The research and development stage was least popular, although it was still noted as happening by 76 per cent of the sample.

Apart from the research stage[117], the answers from respondents in different sizes of companies were not statistically different. A similar impression emerges when the answers are grouped according to the economic sector to which the respondents' firms belonged. Respondents who worked in the Oil and Gas and Financial sectors did not indicate that the Research and Development stage was important; the p-values for these were 0.08 and 0.06, respectively. This result is surprising since one would have thought that research and development was important within the Oil and Gas sector; perhaps the research and development was a task which foreign multi-national partners did in a joint venture. Similarly, with the listing of several banks on the Libyan Stock Market - and the launch of new Islamic Finance-based products - one would have expected financial institutions to be concerned with research and development activities. However, this seems not to have been the case. The second question in the fourth section of the questionnaire[118] gave participants the opportunity to indicate whether their firms employed the stages in Table 6.7 in a different order from that shown in the table. None of the participants answered this question; the absence of any response would suggest that the list of stages supplied was reasonably comprehensive and that the ordering of the stages was not very different from what respondents' companies actually did in practice.

[117] Appendix C, Table 8 highlights that the Kruskal-Wallis test shows a significant difference (p-value 0.01) between different firm size groups regarding the importance of the Search and Development stage (S&D). The result of the Mann-Whitney test reveals that large sized firms tend to give a lower level of importance to the S&D stage (mean 3.455 with p-value 0.05) while the small sized firms and medium sized firms gave a higher level of importance to the S&D stage (means 4.400 and 4.462 respectively with p-values 0.000 for both).

[118] For more detail about the design of the questionnaire and its sections, see Chapter 4: Methodology.

Panel A in Table 6.8 shows that a majority (84 per cent) of the respondents' companies had an ex-post audit phase of up to two years. However, for a small minority of respondents, the ex-post audit process lasted more than four years. Ex-post audit duration varied according to both the sector where the respondent worked and the size of their employer. For example, some 34 per cent of companies in the food industry suggested that the process lasted for more than two years while 80% of participants in the Oil and Gas companies indicated that the audit was complete by the end of an investment's second year. This result is arguably surprising since most investments in the Oil and Gas sector are relatively long lasting (Kuuskraa, 2012). However, the evidence here is consistent with a scenario whereby once the exploration and drilling has happened, the bulk of the expenditure has occurred and the need for subsequent monitoring reduces as a consequence.

Given the importance attached to the ex-post audit phase in most of the literature on investment appraisal (e.g. Pike and Neale, 2006) this issue was investigated in further detail here. Panel B presents details on participants' views about how the ex-post audits operated in practice. According to the answers given, more than half (56 per cent) of the firms in the sample performed ex-post audits by comparing the actual performance of a project with the feasibility study conducted when the project was chosen. About two fifths (40 per cent) of the firms conducted a regular follow-up without benchmarking against a feasibility study. Only 5 per cent of respondents' firms compared the actual outcome with a pre-determined budget.

A disaggregated analysis of the responses across the economic sectors as well as size groups indicated some differences as to how the ex-post audit was conducted. A

sizeable majority (70 per cent) of respondents in three economic sectors (SF, OG and FF) indicated that their firms compared the actual performance with a feasibility study to audit an investment. By contrast, none of the FI firms adopted this method; instead, they all used a regular follow-up when performing their ex-post audits (see Appendix C, Table 9 for more detail).

Table 6.8 Ex-Post Audit

Panel A: Ex-post Audits Period.									
Ex-post Audits Period	Whole Sample	Sectors					Firm's Size Groups		
		SF	MF	OG	FI	FF	Small	Medium	Large
Less 12 months	44%	37%	46%	56%	66%	0%	67%	30%	45%
12-24 months	40%	37%	40%	44%	0%	80%	25%	40%	55%
25-36 months	7%	13%	7%	0%	17%	0%	8%	10%	0%
37-48 months	2%	0%	0%	0%	0%	20%	0%	5%	0%
More 48 months	7%	13%	7%	0%	17%	0%	0%	15%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Panel B: Method.									
Comparing with Feasibility Study	56%	75%	47%	78%	0%	80%	58%	60%	45%
Regular Follow-up	40%	25%	40%	22%	100%	20%	42%	40%	36%
Budgeting	5%	0%	13%	0%	0%	0%	0%	0%	18%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; Budgeting: comparing with the capital budget.

6.7 Capital Rationing

Table 6.9 summarises the answers to research questions about capital rationing. Specifically, participants were asked about the extent to which their firms experienced any rationing of funds, the type of rationing which took place and the reasons for any rationing. The responses to these questions are given in Panel A,

Panel B and Panel C of Table 6.10 respectively. An inspection of Panel A of Table 6.9 reveals that two fifths (40 per cent) of the firms in the sample encountered capital rationing in some of their investment projects, nearly a quarter (24 per cent) of the firms experienced capital rationing in a few of their investment projects and a fifth (20 per cent) of the firms faced capital rationing in most of their investment projects. There were a small percentage of respondents at the extreme ends of this range: either not subject to any rationing (11 per cent) or permanently faced with rationing (4 per cent). These were an unusual group of companies which the respondents worked for. All of those who did not experience rationing were in the SF, FF and MF sectors.

The type of capital rationing which the respondents' firms encountered is shown in Panel B of Table 6.9. Two-thirds (62 per cent) of participants suggested that their firms experienced externally imposed capital rationing (hard capital rationing) (Catt, 1965), with the other one-third (internal 33 per cent) stating that their firms were faced with capital rationing imposed internally by the management (Ross, 1986). This result differs from the findings of previous studies in developed nations which show capital rationing is, in general, internally imposed (Pike, 1983; Mukherjee and Hingorani, 1999).

Panel C in Table 6.9 summarises the reasons why capital rationing occurs in the opinion of the respondents. More than two-fifths (43 per cent) of the sample stated that the discount rates set by banks, lending policy terms and other State actions were the main reasons why capital rationing existed; the Libyan government and the banking sector apparently acted to influence which projects got funded by the raising

Table 6.9 Capital Rationing

Frequency of Capital Rationing.	Total		Sectors					Firm's Size Groups		
	N	%	SF	MF	OG	FI	FF	Small	Medium	Large
Panel A: Frequency of Capital Rationing.										
With all Investment projects	2	4%	22%	0%	0%	0%	0%	0%	11%	0%
With most Investment projects	9	20%	11%	13%	20%	50%	20%	15%	33%	7%
With some Investment projects	18	40%	11%	53%	50%	33%	40%	38%	28%	57%
With a few Investment projects	11	25%	22%	27%	30%	17%	20%	38%	11%	29%
Never	5	11%	34%	7%	0%	0%	20%	8%	17%	7%
Total	45	100%	100%	100%	100%	100%	100%	100%	100%	100%
Panel B: Type of Capital Rationing.										
Internal	13	33%	33%	14%	44%	33%	75%	50%	29%	25%
External	24	62%	67%	72%	56%	67%	25%	50%	65%	67%
Both	2	5%	0%	14%	0%	0%	0%	0%	6%	8%
Total	39	100%	100%	100%	100%	100%	10%	100%	100%	100%
Panel C: Reason(s) forCapital Rationing.										
1.Determination of the money available for investment by the owner	6	28%	33%	0%	40%	0%	100%	0%	44%	33%
2.State actions and/or lending policy and discount rates in the banks	9	43%	67%	50%	40%	50%	0%	50%	44%	33%
3.Maintain liquidity of the company	1	5%	0%	16.7%	0%	0%	0%	16.7%	0%	0%
4.Debt Control	3	14%	0%	0%	20%	50%	0%	16.7%	12%	17%
Two reasons {2,4)	1	5%	0%	16.7%	0%	0%	0%	0%	0%	17%
Two reasons {3,4}	1	5%	0%	16.7%	0%	0%	0%	16.7%	0%	0%
Total	21	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: This table summarises answers to questions regarding capital rationing. It shows the frequency of, type of, and reason for capital rationing in firms' investment appraisal processes. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response.

of interest rates (or other borrowing barriers), which prevented firms from undertaking all their desired projects.

Just under 28 per cent of the participants indicated that the owner of their firm determined the amount of money available for investment and placed a limit on the capital available, and the rationing which took place. Although given the extent of State-ownership in Libya, there is inevitably some overlap with the process. In contrast, only 14 per cent of the sample highlighted the role of debt limits in rationing the capital available for investment by their firms. Therefore, in this instance, the current sample of Libyan respondents were very different from their international counterparts who regularly cited debt capacity as a limiting factor which forced their firms to ration investment funding among positive NPV projects (Pike, 1983; Mukherjee and Hingorani, 1999).

The comparison of the results across economic sectors and size groups in Appendix C, Table 10 shows that there were no statistically significant differences between responses in all but one case; the percentage figures for various economic sectors and different size groups in Panel A, Panel B and Panel C of the table were not different. However, there was a statistically significant difference between the views of those in the FF sector and the replies from those in the MF and FI sectors, the former group (in the FF sector) linked capital rationing to the priorities of the owner, while those in the MF and FI sectors mentioned the State/Banks actions, owner determination and debt control as reasons for capital rationing.

Indeed an inspection of Table 6.9 reveals that respondents from the FF sector highlighted internal limits on the capital budget imposed as the only reason for any rationing that their firms experienced. By contrast, respondents in the FI sector identified two different reasons for the rationing that their companies experienced: (i) actions by the State and/or lending policy and bank interest rates, and (ii) debt control. About two-thirds of the firms in the MF sector also highlighted a third reason (maintain liquidity of the company) as a cause of rationing[119], while the rest of the MF-based respondents stressed the maintenance of liquidity as a key determinant in limiting the investment which occurred.

Two questions were asked in this section of the questionnaire in order to ascertain the viewpoints of participants about the potential role of the LSM as an external constraint on investment funding[120]. An analysis of Panel A of Table 6.10 illustrates that the respondents were optimistic about the role of the LSM in alleviating any constraints on funding which they faced; the vast majority of firms (84 per cent) indicated that the presence of the LSM would help in this context. Support for this view was evident among all respondents who worked in the service firms and financial firms sectors, although only 60 per cent of participants in the Oil and Gas sector agreed with this notion, again suggesting inter-sector variation in perspectives.

It is not surprising that firms in the financial sector looked on the stock market as a funding source for capital investment projects since banks currently constitute the

[119] Some 50 per cent cited this as the only reason and 16.7 per cent as one of two reasons for rationing.

[120] For details regarding the history and development of the LSM see Chapter Three.

majority of listed firms in Libya. What is more surprising is the fact that respondents in capital intensive Oil and Gas firms were less positive than others about the potential of the stock market to mitigate against capital rationing difficulties. It is possible that these firms had links with multinational companies which supplied funding or, alternatively, Oil and Gas firms may have been able to approach State authorities to source capital for new investments.

A similar picture emerges from a disaggregated analysis of the responses according to the size of the participants' companies. More respondents in small firms were positive about the role which the LSM could play in helping companies to avoid capital rationing than were their counterparts in large-sized entities, despite such small companies, presumably, being less likely to be listed in the short-term.

Table 6.10 The Libyan Stock Market's (LSM) Potential Role in Alleviating External Capital Rationing

Panel A: Will the existence of the LSM help to alleviate external restrictions on the funding available for investment?										
	Total		**Sectors**					**Firm's Size Groups**		
			SF	**MF**	**OG**	**FI**	**FF**	**Small**	**Medium**	**Large**
	N	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Yes	**37**	**84%**	100%	93%	60%	67%	100%	92%	89%	67%
No	**7**	**16%**	0%	7%	40%	33%	0%	8%	11%	33%
Total	**44**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Panel B: If the answer is "No", What is the reason(s)?										
1. Lack of awareness of the role of LSM	**4**	**80%**	0%	100%	67%	100%	0%	100%	100%	67%
2. 1+Lack of confidence in the credibility of the LSM	**1**	**20%**	0%	0%	33%	0%	0%	0%	0%	33%
Total	**5**	**100%**	**0%**	**100%**	**100%**	**100%**	**0%**	**100%**	**100%**	**100%**

Note: This table summarises opinions about the role of the LSM in alleviating external capital rationing and, if the answer was No, the reason. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response.

It may be in fact that the large-sized companies had more funding sources available to them in practice and the respondents' replies simply reflected this difference. To address these issues, respondents who answered "No" to the question about the ability of the stock market to alleviate externally imposed capital rationing were asked to explain their choice.

Inspection of Panel B of Table 6.10 shows that all the participants who answered "No" to the previous question highlighted a lack of awareness about the role of LSM as a source of funding for positive NPV investments; they suggested that this ignorance would prevent companies from considering the market as a source of financing for their projects. A fifth (20 per cent) of the respondents who answered "No" also expressed a lack of confidence in the credibility of the information which was provided by the LSM; they suggested that a company's share price might not reflect a listed firm's intrinsic value, negatively impacting on the ability of a company to convince investors about the future potential of a positive NPV project. An analysis of the differences between the responses across the different economic sectors and between the various size groups revealed no statistically significant findings (See Appendix C, Table 11 for more details)[121].

Table 6.11 asked respondents about the role of the LSM as a source of funding in the future and the type of financial products that their firms might use to finance capital projects. Panel A of this table shows that the majority of the respondents' firms (84 per cent) were considering using the LSM to raise finance for investments

[121] The p-value for the Kruskal-Wallis in Appendix C, Table 11 shows that there is no statistically significant difference between the economic sectors and/or between the size groups.

in the future. An inspection of Panel B reveals that the majority (60 per cent) of the firms are intending to use more than one financial product (new shares and bonds, new shares and offering part of the existing capital for public subscription or all three products) to fund future investments; just under one-third (30 per cent) of the participants' firms indicated that their firms might just issue new shares.

Not surprisingly, a new share issue was the most commonly mentioned future financial option among the participants; this was selected by 91 per cent either separately or in combination with other financial products.

Offering part of the owner's existing equity for public subscription was mentioned by around half of the participants (48 per cent separately or combined with other financial products) while the issuing of bonds was in third place, being mentioned by only 39 per cent either separately or combined with other financial products.

An analysis of the differences among the responses according to economic sector and the size group revealed no statistically significant findings; an exception to this generalisation related to Panel B of Table 6.11, where the difference between respondents indicated that all small sized firms in the sample expected to use a combination of different financial products in the future in order to obtain funding from the LSM. By contrast, two-thirds[122] of the large sized firm respondents (68 per cent) planned only to issue new shares if seeking funding from the LSM (see Appendix C, Table 12 for details).

[122] In Appendix C, Table 12, the Kruskal-Wallis p-value shows that there is a statistically significant different (at the 5 per cent level) between the small sized and large sized groups for this question.

Table 6.11 the LSM as a Source of Funding in the Near Future

Panel A. Does firms consider that LSM will be a source of funding for your firm in the future?										
	Total		Sectors					Firm's Size Groups		
			SF	MF	OG	FI	FF	Small	Medium	Large
	N	%	%	%	%	%	%	%	%	%
Yes	37	84%	67%	53%	50%	17%	60%	38%	60%	50%
No	7	16%	22%	47%	40%	83%	40%	54%	35%	50%
Neutral	0	0%	11%	0%	10%	0%	0%	8%	5%	0%
Total	44	100%	100%	100%	100%	100%	100%	100%	100%	100%
Panel B: What is the type of the potential financial product(s)?										
1.Issuing new shares	7	30%	17%	38%	40%	100%	0%	0%	25%	68%
2.Issuing bonds	1	5%	0%	0%	20%	0%	0%	0%	8%	0%
3.Offering part of the existing capital for public subscription	1	5%	17%	0%	0%	0%	0%	0%	8%	0%
Two Products {1,2}	4	17%	0%	12%	40%	0%	33%	20%	17%	16%
Two Products {1,3}	6	26%	17%	38%	0%	0%	67%	40%	25%	16%
Three Products {1,2,3}	4	17%	49%	12%	0%	0%	0%	40%	17%	0%
Sector Total	23	100%	100%	100%	100%	100%	100%	100%	100%	100%
Panel C: The potential financial products Separately.										
1.Issuing new shares	21	91%	83%	100%	80%	100%	100%	100%	83%	100%
2.Issuing bonds	9	39%	50%	25%	60%	0%	17%	60%	42%	16%
3.Offering part of the existing capital for public subscription	11	48%	83%	50%	0%	0%	33%	80%	50%	16%

Note: This table summarises views about LSM as a source of funding in the near future. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response.

6.8 Islamic Finance

The next part of the questionnaire examined views about the role of Islamic finance; Table 6.12 summarises the responses. The table is split into four panels. The first relates to current usage of Islamic finance while the second asks about the Islamic financial products that are used. The third panel reports respondents' preferences for Islamic finance to fund capital expenditure while the fourth panel ascertains reasons as to why Islamic financial products might be preferred by firms.

Table 6.12 Islamic Finance

	Total		Sectors					Firm's Size Groups		
			SF	MF	OG	FI	FF	Small	Medium	Large
Panel A: Has your firm Used Islamic Finance previously?										
Yes	**3**	**7%**	11%	13%	0%	0%	0%	0%	11%	8%
No	**41**	**93%**	89%	87%	100%	100%	100%	100%	89%	92%
Total	**44**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Panel B: If the answer is "Yes", what type of Islamic Financial product(s) were used?										
Murabahah	**2**	**67%**	0%	100%	0%	0%	0%	0%	50%	100%
Rent to Own	**1**	**33%**	100%	0%	0%	0%	0%	0%	50%	0%
Total	**3**	**100%**	**100%**	**100%**	**0%**	**0%**	**0%**	**0%**	**100%**	**100%**
Panel C: Does your firm Consider Islamic Finance to be its preferred source of funding?										
Yes	**29**	**68%**	75%	73%	50%	67%	75%	75%	68%	58%
No	**13**	**30%**	25%	20%	50%	33%	25%	25%	32%	33%
Neutral	**1**	**2%**	0%	7%	0%	0%	0%	0%	0%	9%
Total	**43**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Panel D: If the answer is "Yes", what is the reason(s) for this preference?										
Religious Reason	**23**	**51%**	22%	67%	50%	67%	40%	54%	45%	58%
To Avoid Pay Interest	**16**	**36%**	33%	27%	40%	50%	40%	38%	35%	33%
Risk Sharing	**14**	**31%**	44%	7%	40%	33%	60%	31%	35%	25%
Looking for Partnership	**12**	**27%**	44%	20%	20%	17%	40%	23%	35%	17%

Note: This table summarises answers about a series of detailed questions regarding the use of Islamic Finance. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response.

Panels A and B of Table 6.12 show that only 7 per cent (3 firms) of the respondents' firms had ever used Islamic finance; two had employed Murabaha and one used Rent-to-own[123]. The users of these products came from just two sectors, Services and Manufacturing, and only from the large and medium sized firm groups. Panel C in the same table presents details about the preferences of respondents' firms for Islamic Finance. Some two-thirds (68 per cent) of the participants' firms indicated a preference for Islamic Finance as a source of funding, which is much higher than the percentage currently using this form of finance. This pattern might suggest that although the majority of firms want to use this form of funding, it may not be widely available within Libya. Panel D reports the reasons given by the respondents who answered 'Yes' in Panel C about the preference for Islamic Finance. An analysis of the responses indicated that most participants preferred Islamic Finance for religious reasons; this answer was selected by just over half (51 per cent) of the sample.

Avoiding the payment of interest was ranked second with 36% of the sample indicating its influence. Risk sharing was highlighted by just under a third of the participants, and the searching for partnerships was also mentioned by more than a quarter (27 per cent) of the respondents. Religious reasons were cited by most of the respondents who worked in the Manufacturing and Food areas, while risk sharing was a more commonly expressed motivation in Financial firms; however none of these or the other differences revealed in Table 6.12 were significant at the 5 per cent level (see Appendix C, Table 13 for more details).

[123] See Chapter Two for more details about Islamic financial products.

Although not shown in the Table[124], the questionnaire also explored the reasoning behind the decision of those companies who did not express a preference for Islamic finance. Only three participants answered this question, two from the Oil and Gas sector who both stated that Islamic Finance was not used as a source of finance by firms such as those owned by the Libyan National Oil Corporation (NOC). The other respondent, who worked in the Services sector (SF), put forward three reasons as to why Islamic Finance was not the preferred source of finance for his firm; first, he argued that, in his view, the Islamic Finance products currently available did not meet the requirements of Shariah Law; second, the risk resulting from changing to Islamic Finance was problematic; and third, the absence of agreed standards and principles meant that any evaluation of Islamic finance was difficult.

Respondents were also asked for their views about the characteristics of potential projects that might favour the usage of Islamic finance. Participants in two firms stated that the size of a project could increase the likelihood of using Islamic Finance; In the case of large-scale investments, such as infrastructure and housing projects, they suggested that Islamic financial product provides the stability needed, especially if there were no fines for delayed payment, and all payments were made at pre-agreed intervals. Three participants mentioned that Islamic funding was most suitable for projects with relatively low risk, short payback periods and high rates of return; one respondent suggested that housing, commercial real estate and infrastructure projects were good examples of investments that might be funded by Islamic finance since

[124] See Appendix C, Table 14 for more details.

they are relatively low risk and offer a steady level of return once finished[125]. Thus, they would be attractive ventures to providers of Islamic Finance who might be willing to share some of the low risk involved.

6.9 Influence of Outside Groups

Table 6.13 summarises the answers to the final part of the questionnaire; it provides an indication of respondents' views about outside influences on the capital investment decision-making processes in their firms.

As inspection of this table indicates that 'Economic and Financial Policy of the State' was comfortably the most important outside influence on a firm's decision-making process (with a mean of 4.000); this point was highlighted by ten firms even though it had not been included in the list of options provided in the questionnaire; it was indicated by all those participants as an important influence. Respondents suggested that their firms were less influenced by the providers of funding, accounting and financial education and the accounting profession (with means of 2.880, 2.730 and 2.310, respectively).

The only statistically significant difference across the economic sectors and size groups related to the influence of accounting and financial education. Representatives

[125] Two other questions were included in this section; these were designed to find out if investment appraisal techniques and/or the risk evaluation methods were different for a project that employed Islamic Finance relative to other projects. These two questions were not answered by any of the companies in the sample (See Appendix C, Table 15).

Table 6.13 External influences on the Investment Appraisal Process

Groups				Sectors					Firm's Size Groups		
				SF	MF	OG	FI	FF	Small	Medium	Large
	Number	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
	%	(P-Value)	Rank	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)	(P-Value)
Economic & Financial Policy of the State	**10**	**4.000**	**1**	**4.667**	**3.750**	**3.750**	**0.000**	**3.500**	**3.000**	**4.500**	**4.000**
	(22%)	(0.01)		(0.04)	(0.06)	…….	(0.00)	(0.80)	(1.00)	(0.06)	……..
Accountant Practitioners	**42**	**2.310**	**2**	**3.222**	**2.000**	**2.125**	**1.667**	**2.600**	**2.833**	**2.278**	**1.833**
	(93%)	(0.00)		(0.65)	(0.03)	(0.09)	(0.01)	(0.59)	(0.71)	(0.03)	(0.01)
Fund Provider	**42**	**2.880**	**3**	**3.444**	**2.571**	**2.750**	**2.833**	**3.000**	**3.083**	**3.056**	**2.417**
	(93%)	(0.56)		(0.23)	(0.25)	(0.63)	(0.74)	(1.00)	(0.78)	(0.88)	(0.11)
Accounting & Financial Education	**41**	**2.730**	**4**	**4.000**	**2.357**	**2.800**	**1.667**	**3.250**	**2.923**	**2.938**	**2.250**
	(91%)	(0.23)		(0.04)	(0.12)	(0.62)	(0.01)	(0.79)	(0.86)	(0.86)	(0.07)
Total Mean		**2.740**		**3.643**	**2.435**	**2.620**	**2.056**	**3.000**	**2.948**	**2.875**	**2.350**
		(0.00)		**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(1.00)**	**(0.00)**	**(0.09)**	**(0.00)**

Note: This table summarises responses regarding the influence of the outsider groups on the investment appraisal process. Keys: SF: Services Firms; MF: Manufacturing Firms; OG: Oil & Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response; t-test P-Value < 0.05 indicates the mean is significantly different from the often position (3) ; 1:completely unimportant; 2:unimportant; 4:important; 5:very important.

from the SF group (mean= 4.000) reported being more strongly affected by this factor than were their counterparts in the MF (mean= 2.357) and FI group (mean=1.667)[126].

6.10 Conclusion

This chapter has reported the results of a detailed questionnaire-based study of views amongst Libyan firms regarding the capital investment appraisal process. The analysis covered a wide range of pertinent issues including usage of techniques, handling of risk, impact of capital rationing, role of Islamic finance and extraneous influences on the process.

The results themselves reveal a number of patterns in corporate views, not all of which are consistent with what might reasonably have been expected in such a research environment, but they point nonetheless to the changing nature of Libya's political economy, even prior to the uprising of 2011. For example, the results suggest that while usage of the most theoretically sound investment appraisal techniques in Libya has increased since studies from previous years, the dramatic shift in balance away from payback (and other less "sophisticated" techniques") towards discounted cash-flow methods seen in the developed world over the last 20 years has not yet been fully replicated in this emerging nation. However, the evidence also points to the (arguably contradictory) widespread use of sophisticated risk techniques; this suggests that, as this thesis acknowledges, questionnaire responses themselves do not necessarily provide evidence of deeper engagement

[126] See Appendix C, Table 16 for more details.

with the issues being studied – interview analysis is essential to complement survey responses and to explore levels of understanding of the issues concerned more fully.

The results reflect the pervasive influence of the Al-Gaddafi government in several ways, even in its last days - despite formal programmes officially aimed at moving the Nation in the direction of a free-market economy; in particular, the dominance of State priorities on investment decision-making was evident amongst the respondents. Nonetheless, whilst usage of the embryonic LSM was limited, it was seen as having an important future role. The topical issue of Islamic finance, while apparently being the preferred source of funding for capital projects, was actually only employed in practice by 7% of the respondents' firms, again suggesting that the issues reported here are worthy of the detailed analysis that only a mixed set of research methods can provide. Finally, it should be noted that in Libya, despite a governmental hegemony being clearly evident, a number of significant differences were noted across firm size and industry groups, suggesting that even in autocratic contexts, identifiable variability in corporate views and practices still exists.

Having now completed the reporting of the empirical results themselves, the next (concluding) chapter attempts to synthesise the important findings from the two sets of results as well as pointing out the study's limitations and making suggestions for further work in the area.

Chapter Seven

Conclusion, Limitations and Future Research

7.1 Introduction

This chapter outlines the important findings from the empirical results presented in this thesis regarding investment appraisal practices within Libyan companies; it synthesises the results from the analysis undertaken, acknowledges the limitations which remain and highlights the contribution of the work to knowledge about capital budgeting in Libya. This chapter concludes by suggesting potential avenues for future research.

This thesis sought to assess the state of current investment appraisal practices within Libya. In particular, the study aimed to document evidence about the capital budgeting process as a whole. It also sought views on the actual factors which play an important role in the final decisions about how the investment appraisal process operates within Libyan companies. The remainder of the chapter is structured as follows. Section 7.2 of this chapter provides a summary of the four main themes to emerge from the empirical findings; it highlights a number of conclusions about the capital investment appraisal process within a framework that provides answers to the four research questions that were initially posed at the start of this thesis. Section 7.3 highlights the main limitations of this study. Section 7.4 outlines the key contributions to knowledge which the thesis makes and discusses the possible applications of the results for Libyan practice. Section 7.5 suggests a number of potential areas in which this work could be developed by future researchers based on the empirical findings from this study. Finally, Section 7.6 concludes.

7.2 Empirical Findings

This section highlights the major findings from the various results arrived at via the empirical analysis conducted in this thesis; the semi-structured interviews and the questionnaire survey. These major findings provide answers for each of the research questions outlined in Chapter 1.

7.2.1 How do Libyan firms appraise capital investment?

The empirical work in this thesis provides evidence on a number of issues which answer this main question. For example, the analyses in Chapters Five and Chapter Six suggest that Libyan companies in the sample tend to use those IATs frequently recommended in most corporate finance textbooks when appraising investments. The four main techniques that are discussed in most textbooks (NPV, IRR, PB and ARR), are commonly used. The PB was the most popular technique while NPV, IRR and ARR were rated second, third and fourth, respectively. These results are in line with the global popularity of PB which is well-documented in the substantive literature (Klammer and Walker, 1984; Sangster, 1993; Elumilade et al., 2006). Actually, the popularity of PB among Libyan firms (at 98 per cent) appears to have increased, compared with the results of two earlier Libyan studies; AlObeidi (1985) documented that 20 per cent of his sample used the PB method while AlWakil (2000) reported that 74 per cent of the firms in his study employed this technique for investment appraisal.

A majority of the Libyan firms in this current study used multiple techniques to appraise investments; this is no different from results documented in previous studies for developed countries (Sangster, 1993; Akalu, 2003; Pike and Neale, 2006) as well

as some less-developed nations (Toit and Pienaar, 2005; Elumilade et al., 2006). Furthermore, the PB is one of the techniques included in this combination of appraisal approaches employed - similar to the finding of Elumilade et al, (2006) in their analysis of 94 companies.

As regards the employment of DCF techniques, the empirical evidence shows that there is an increasing use of NPV and IRR among the companies included in the sample. However, the usage rates for these techniques among Libyan companies are lower than those documented in previous well-known studies for developed countries (Klammer and Walker, 1984; Pike, 1988; Sangster, 1993; Pike, 1996; Kester and Chong, 1998; Pike and Neale, 2006) and in some emerging markets (Gilbert, 2005; Toit and Pienaar, 2005; Correia and Cramer, 2008). In terms of the usage of NPV and IRR, the results of this study show that NPV was mentioned by 67 per cent of the interviewees along with IRR and both were used with other methods; they came second after PB and ARR. In the questionnaire survey results, 80 per cent claimed that NPV was used while 73 per cent of the participants mentioned that IRR was employed.

The Libyan companies surveyed in this study were asked not only to highlight the techniques used but also to state how important these techniques were in their capital investment decision-making processes. An analysis of the findings revealed that the companies attached a great deal of importance to each of PB, PI, IRR and NPV (with importance means of 4.364, 4.320, 4.303 and 4.056, respectively). However, the PB method seemed pivotal; respondents from the companies suggested that their firms relied more on the results of the PB period than on any NPV calculations - even though they usually employed both techniques.

Respondents to the questionnaire survey and the interviewees were also asked to comment on the role of non-financial criteria in their companies' investment appraisal decisions. Although Libyan companies used financial techniques to appraise capital investments, the non-financial criteria took priority over the financial calculations according to most of the respondents; specifically, political support from the Government for one economic sector or another, the priorities of the State development plan and the personal experiences of the managers were all highlighted as key non-financial criteria which influenced whether or not an investment would be approved. This result is consistent with the findings of the study by Hall and Millard (2010) where the authors documented that non-financial criteria played an important role in capital investment decisions. From the interview analysis, Libyan companies often used the financial techniques within the framework of a feasibility study, which was normally viewed as one of the legal requirements which had to be fulfilled in order to obtain the required financing from banks or government agencies that provided loans. This finding is not surprising for a country such as Libya which has experienced extreme changes both politically and economically over the last four decades; under the Al-Gaddafi regime, Government policy was characterised as socialist with a centrally directed economic system fully dependent on State-owned economic activities - from the largest economic organisations to the smallest economic activities such as local bakeries and grocery shops. In such a situation, it is hardly surprising that non-financial factors played a key role in capital investment decisions.

Based on the developed conceptual framework in section 4.2.1, the perspective of new institutional sociology argues that such a role for non-financial criteria may reflect central government control over the entire economy through the regulations,

ownership structures and development plans. Moreover, the state controls the main source of funding for any potential projects, thus applying coercive pressures over capital investment decision-makers in Libyan firms. The coercive isomorphism is itself a result of the political pressures exercised by institutions which organisations depend upon for providing legitimacy, critical resources and long-term survival, for example, government policies, regulations, laws and funding (DiMaggio and Powell, 1983). This point is illustrated in the results of the interviews' analysis, where participants explained that the feasibility studies, which involve the use of sophisticated financial methods in capital investment appraisal, are often a legal requirement only, provided in order to justify new projects to obtain funding.

On the other hand, post-colonial theory provides a potential explanation of why Libyan firms in the sample report calculating financial appraisal technique results, whilst giving non-financial criteria higher importance. The influence of the UK and the US education style on Libyan universities in general, and business schools in particular, might explain why despite the very different environmental factors in Libya, firms still feel a need to go through the motion of doing the financial calculations recommended in the UK and the US textbooks, despite the final capital investment decision in Libyan companies being based primarily on non-financial criteria.

Another finding of this research is that project features appeared to influence the choice of IATs employed according to half of the participants interviewed; admittedly, the other half stated that the project features played no role in determining which appraisal method or combination of techniques should be used to appraise a project. However, half of the interviewees argued that the capital investment project features such as the size of the investment and the source of any

funding played a key role in the choice of the appropriate techniques used to evaluate a project. For instance, if the size of the capital investment project was large and/or involved borrowings, the firm tended to employ a combination of more sophisticated techniques such as NPV and IRR as well as simpler methods such as PB and ARR when evaluating a project. These interview findings were supported by the questionnaire results in terms of the importance of the role of the project features in the determination of the type and number of techniques which should be used to appraise a particular capital investment project. Indeed, the source of funding was highlighted as the most important feature that played a key role in determining the choice of technique and the number of appraisal techniques employed; the project size and the nature of the project were ranked second and third, respectively. This evidence is consistent with the findings of previous studies in developed countries (Mills and Herbert, 1987; Pike, 1996).

Both empirical investigations within the current thesis sought views on the sources of new investment ideas and number of stages within the capital investment appraisal process for Libyan companies. According to the interview results, new investment ideas stemmed from the personal experiences of employees or the insights of investors in the companies; market studies were ranked third. This result makes the Libyan case, to some extent, different from the evidence of previous studies in the US and the UK, which placed more emphasis on market studies as the main source of capital investment ideas (King, 1975; Pinches, 1982). Again, the Libyan environment with its centrally planned economy and strong emphasis on Government policy direction will, no doubt, have reduced the emphasis placed on market studies and market testing as sources of new investment ideas. As a result, the

role of employees and owners in suggesting new ideas may have risen in prominence.

As regards the number of stages in the capital investment decision-making process, the analysis of the interviews showed that there were differences of opinion between the firm-based and outsider interviewees (bankers, academicians and chartered accountants); these differences mainly centred around the number of stages involved in the investment process. While the majority (81.5 per cent) of firm-based participants suggested that a five-stage process existed (which included determination, search and development, evaluation, authorisation, and monitoring and control as described by Pike and Neale (2006)) the remainder of the firm-based interviewees pointed to a process which involved seven stages (which were similar to those documented by Arnold (2008) and included such stages as the generation of ideas, the development of a proposal, project classification, screening, appraisal, authorisation and implementation and post-completion audit). On the other hand, the outsider group indicated that - in their view - Libyan companies' capital investment decision-making procedures were not multi-stage processes. Moreover, some of the outsiders stated that if these stages did exist in Libyan companies, they only did so because they were required by the regulations and rules employed by the fund providers or the regulatory authorities. The results of the questionnaire reinforced the findings from the firm-based interviews. A five-stage process, which is most commonly highlighted in the literature, was the procedure typically selected by this sample of Libyan companies. Again, the outsiders highlighted that the different steps which companies claimed to follow in practice were only followed because of external requirements; thus, they suggested that many of the steps were simply "box ticking" exercises.

The results in this thesis indicate that the sources of capital investment ideas in Libyan firms usually emerged in the first place from the personal experience of the employees or the insights of the owner or the investor; this is different from what is typically recommended in conventional "Western" thinking, i.e. that the market studies should be the main source of funds and ideas for capital investment. These sources of ideas and the influence of political factors such as the state's development plan and the economic orientation of the government can be interpreted in the context of the developed conceptual framework; it is in this context that the theory of new institutional sociology is relevant in making it clear that this kind of effect arises from the coercive pressures of institutional isomorphism. The same interpretation applies to the number of stages found here in capital investment decision-making processes in Libyan companies; the stages that exist will do so mainly because they are required by the funding providers or the owners of the company which, in this case, is mostly the government.

The results from the questionnaire coincided with the findings from the firm-based interviews. The five-stage process, which was often identified in the literature, was seen as the process which characterised practise among this sample of Libyan companies. In addition, the participants in the questionnaire highlighted the monitoring and control stage as the most important phase; this was followed by the "determination of the budget" and the "authorisation" stages which were both ranked second. To some extent, these results are comparable with findings from studies in developed countries; for instance, King (1975) and Mclntyre and Coulthurst (1985) highlighted the importance of both the evaluation stage and monitoring and control stage in their analyses of the process. These authors linked the emphasis on evaluation to the influence of traditional financial education and financial textbooks.

The role of financial and accounting education in Libya which was discussed in Chapter 3, supports this point of view; specifically financial and accounting education in Libya was mainly based on British textbooks and a UK-focussed curriculum in the 1950s, 1960s and early 1970s; this was followed by an emphasis on US textbooks and a US curriculum from the end of the 1970s (Kilani, 1988; Mahmud, 1997).

Post-colonial theory gives a potentially more relevant interpretation of the influence of education over the number of stages and their names as stated by the participants, i.e. where the participants have chosen certain labels for stages and linked them to a particular level of importance that reflects their educational background rather than a realistic description of the practice among the companies where they work.

In terms of the ex-post audit phase, a majority of the firm-based interviews and firm-based questionnaire respondents conducted their audit within two years or less of the project start date. This mirrors the results from studies conducted in developed countries (Neale and Holmes, 1988; Neale and Buckley, 1992; Neale, 1995; Arnold and Hatzopoulos, 2000). More than 50 per cent of the firms claimed that they were implementing ex-post audits by comparing the actual performance of the project after implementation with what would have been expected from the economic feasibility study on which the project was based.

However, about half of the outsiders believed that the Libyan companies only followed-up on projects in a general way; they did not conduct ex-post audits as recommended in the literature. These outsiders postulated that when Libyan companies prepared feasibility studies, they intended to use them for a purpose other

than decision-making. They suggested that these studies were usually used to justify any potential capital projects to the funding providers; thus may be a function of the Libyan environment in which these firms operated and the business practices influence by the centrally-planned economy, and the non-financial criteria that play a more important role more than the financial factors.

The role of real options and the importance of different evaluation criteria for AMT were covered in the interview section of this thesis. They were excluded from the questionnaire survey to allow for more questions about Islamic finance because of the interest in Islamic finance which emerged from the interviewees; the lack of awareness about real options and the dearth of knowledge about AMT projects were other reasons why these issues were not included in the questionnaire. The evidence from the interviews showed that most firms considered real options as a kind of flexibility in a similar fashion to the approach uncovered in Busby and Pitts (1997); different people had a different understanding of what was meant by the term real options. Participants acknowledged that their firms dealt with the flexibility subjectively, but not in the manner described in the literature and without employing any scientific methods; the results from this study were similar to the evidence from developed countries which documented that most managers evaluated flexibility subjectively using rules of thumb (e.g. Busby and Pitts, 1997). Regarding the projects which involved the adoption of AMT, 75 per cent of the firm-based interviewees stated that their firms had AMT projects but most of the participants admitted that their companies did not employ specific techniques to appraise a capital investment which involved AMT.

7.2.2 Do Libyan firms incorporate risk into their capital investment appraisal process?

An analysis of the interviews revealed that only one participant out of eight firm-based interviewees claimed that their firm used objective techniques (WACC) to include risk in their appraisal of capital investments; the others adopted a more subjective approach. Thus, all the outsider interviewees who believed that Libyan companies did not use objective approaches to evaluate risk were correct in their assessments. Instead, these outsider interviewees suggested that Libyan firms used interest rates as their measure of the discount rate. Some of the outsider participants explained why companies adopted this approach; they argued that, in the Libyan environment, high levels of uncertainty made it very difficult to include risk in any evaluation of a capital project. They pointed to the instability of the economic and administrative policies of the Government as well as the frequent changes in the decisions of the regulatory authorities as factors behind this uncertainty .

In the second phase of the study, the questionnaire results arrived at a different conclusion. The responses of the survey participant showed that 82 per cent of firms did assess risk mentioning more than one method in their calculation of risk. However, an interesting point to emerge from the questionnaires, is that there were eight firms who did not take account of risk in capital budgeting; most of them were large sized firms in contrast to the results of developed countries where evidence suggests that large companies are the most likely to incorporate risk into their investment analysis (Ho and Pike, 1991). In terms of the methods used to evaluate risk, the Libyan firms in the sample mostly used subjective approaches. However, they tended to give greater importance to the simpler methods of risk adjustments such as break-even analysis, the shortening of the PB period and the raising of the

required rate of return. There was some improvement in the usage of more sophisticated methods to assess risk among Libyan companies compared with the findings of previous Libyan studies (AlObeidi, 1985; AlWakil, 2000). For example, the vast majority of firms in these prior studies evaluated risk subjectively.

Despite this improvement in the usage of sophisticated risk assessment methods, only 50 per cent of the participants in the questionnaire stated that their firms calculated a cost of capital. A majority (68 per cent) of these companies used only one method to do so; the CAPM/WACC was employed by 45 per cent of the firms for this purpose. Lastly, 36 per cent of respondents relied on subjective judgement (mostly using a modified version of the interest rate) when estimating their cost of capital. A minority of the respondents (9 per cent) whose firms used different discount rates for different projects, highlighted three reasons for this action: (a) to meet the conditions of the project; (b) to reflect the time value of money; and (c) to cope with the changes in the discount rate (interest rate).

The Libyan companies usage of simpler methods to address risk, such as break-even analysis, shortening of the PB period and a rise in the required rate of return, reflecting the significant impact of the risk associated with political instability in the nation caused by the actions, economic orientation and policies adopted by the government. Again new institutional sociology theory provides a potential rationale for this evidence, where the coercive pressures of institutional isomorphism existing in Gaddafi-era Libya inevitably have a strong influence on the capital investment appraisal process in Libyan firms. Dreyhaupt et al. (2012) argue that surveys of multinational corporations have consistently shown that political risk is the top concern of investors over the medium term. Recent international developments are relevant here, with investor perceptions of political risk being intensified by

developing countries' desire to control their natural resources, economic crises, terrorist threats and civil society.

7.2.3 Do Libyan firms face capital rationing and, if so, is it externally or internally imposed?

The results from both the interviews and the questionnaire highlighted that the majority of the companies participating in this study had experienced rationing at some point in the recent past (75 per cent of the firm-based interviews and 89 per cent of the firms which participated in the questionnaire supported this view). The evidence from both the interviews and the questionnaire indicated that externally imposed capital rationing was the most commonly experienced restriction on funding experienced by Libyan companies. In contrast to the findings of several studies in developed countries, which have documented that internally imposed capital rationing is common amongst firms in the UK and US (Pike, 1983; Trivoli and McDaniel, 1987; Mukherjee and Hingorani, 1999, Mukherjee et al., 2000), internally imposed limits on capital spending was not an issue for most Libyan firms consulted. However, external limits on funding were only an intermittent problem for most Libyan companies; when the participants were asked about the frequency with which capital rationing occurred it was found that only 24 per cent of the questionnaire respondents claimed that their firms always or mostly experienced this form of capital rationing.

Not many of the interviewees put forward a reason for capital rationing. All of them that did advance an explanation stated that internally imposed capital rationing was mainly used to control the debt levels of companies. The questionnaire analysis showed that the most common reasons for capital rationing were the actions of the

State (the government) which limited funding to those sectors not prioritised in the latest five-year plan, restrictions placed by the owner of the company on the amount of money allocated or borrowed to finance new projects and/or the debt limits set by the firm's management (43 per cent, 23 per cent and 14 per cent respectively).

This thesis sought views on the role of the newly established Libyan Stock Market as a source of finance which might alleviate any shortage of funding. The interview results showed that half of the participants did see a potential role for the Libyan Stock Market in the future as a source of funding which could alleviate externally imposed capital rationing. However, the other half did not see any role for such an institution in the near future. However, according to the questionnaire result, 84 per cent of the participant companies believed that the stock market would help Libyan companies to access funds and thereby alleviate the impact of externally imposed capital rationing. Moreover, 91 per cent of these firms said that they planned to issue new shares in the future. Several arguments were advanced by those who believed that the market would not play a significant role in reducing external restrictions on funding which Libyan companies might face in the future. The most frequently cited reasons were (a) the lack of knowledge among Libyan firms about the functioning of the stock market; and (b) a lack of awareness among companies of how they could take advantage of this opportunity in practice.

This is another example of institutional coercion. The actions of the government and its restrictions on funding available for firms are the main reason for the externally-imposed capital rationing common among Libyan companies.

7.2.4 Does the availability of Islamic Finance affect Libyan firms' views of the capital investment appraisal process?

Islamic financial products were preferred by a majority of the Libyan companies in both the interviews and the questionnaire (90 per cent and 69 per cent respectively). The evidence from the questionnaire shows that the main reasons for this preference were the religious views of the firms' owner, the avoidance of interest payments and the advantages of risk sharing through Musharkah[127] funding which involves "A joint enterprise or partnership structure with profit and loss sharing"; reasons were put forward as justifications for this preference by 51 per cent , 36 per cent and 31 per cent of the sample, respectively. The actual usage of Islamic finance products was much lower than the preferences for this type of funding; only 7 per cent of the questionnaire participants confessed that their firms had used Islamic financial products (67 per cent used Murabahah and 33 per cent used Rent to Own schemes). The other participants who did not want to use Islamic funding products (13 per cent of the questionnaire participants) were asked why. A majority stated that currently available Islamic financial products were not fully in compliance with the requirements of Shariah Law. In fact, they argued that the current Islamic funding providers used ordinary commercial financial products and just added Islamic names. For instance, interviewee C7, who was an owner and the CEO of a manufacturing company, when describing existing Islamic finance products, stated that:

> *"...we prefer the Islamic finance, but Islamic finance is still inefficient, and it is based on commercial banks products with Islamic names.... "* C7

[127] See Chapter Two for more details about Islamic financial products.

The isomorphism process is described by Carruthers (1995) as an institutionalisation process motivated by cultural and political factors. This description provides an interpretation for the preference for Islamic financial products' preference amongst the majority of Libyan firms in this study, despite the clearly-expressed concerns about the extent to which Islamic financial products currently available concur with Islamic values as laid down in Shariah Law.

7.3 Limitations of the Study

The thesis aimed to explore and interpret the capital investment appraisal process in Libyan companies. Although every effort was made to provide a fairly comprehensive and systematic investigation based on a detailed research analysis throughout the thesis, the work is bound to be incomplete. As with any other research, a number of limitations exist. The aim of this section of the chapter is to outline these limitations so that a complete evaluation of the contribution of this thesis can be arrived at.

The limited number of participants in the semi-structured interviews is one of the limitations of the work undertaken. Only 20 interviews were conducted for two reasons. First, there were difficulties getting access to officials at administrative levels in Libyan organisations such as CEOs and CFOs; the culture within Libya is based on secrecy and the idea of giving interviews to researchers where sensitive issues might be discussed is viewed with suspicion in the country. Second, the sample was designed to represent different organisations' points of view; thus, it was hoped that each interviewee would represent an organisation and be involved directly in the capital investment decision-making process. After a great deal of effort and time, a diversified group of participants was eventually interviewed; as far as

possible, the sample was drawn from a wide range of economic sectors, had different levels of experience and different educational backgrounds. However, a different sample might have offered different opinions.

The same limitation applies to the questionnaire survey sample; this sample was designed to represent a cross-section of companies by selecting participants from the highest level in each firm's administration who were directly involved in the capital investment decision-making process. Again, the number of questionnaire returns achieved was limited, for some of the reasons mentioned above. In addition the absence of an efficient postal system in Libya and the dearth of email usage among Libyan firms forced the researcher to distribute and collect the questionnaire forms in person. Nonetheless, an acceptable number of questionnaire replies was obtained from a widely diverse group of respondents in terms of the economic sectors where they worked and the size of firms where they were employed. However, there is no way of knowing whether the respondents are a statistically representative sample of the population of firms which exist within Libya.

In terms of the research methods employed in this study, semi-structured interviews and a questionnaire survey were used; however, both are subject to problems. Incomprehension and misinterpretation may affect certain questions for a number of reasons. For instance, the participants may not have been familiar with the topic of the questions, but unwilling to admit this ignorance; instead they possibly provided unrealistic information[128]. In addition, there are difficulties surrounding the process of analysing and interpreting the responses; to some extent, this analysis and

[128] An example of such unrealistic information is the surprising number who indicated that their firms used the CAPM to estimate their discount rate. This answer is surprising since, in a Muslim country, the notion of a risk-free rate is problematic. Further, since the LSM is small, estimates of the return on the market may be problematic. Finally, since only 14 companies are quoted, estimates of beta will not be available for most companies.

interpretation depends on the perspective of the researcher about these topics. Thus, there is a great deal of subjectivity involved and the findings may not be generalisable.

The second limitation relates to the way in which the sample size was decided and the companies included chosen. In the case of Libya, there is no official data base or record for all the companies operating in Libya. This limitation, has been documented in previous Libyan studies, such as Buferna (2005). In addition, the LSM is a young stock market with a very small number of listed companies - mostly banks and insurance companies. However, the researcher has made every effort to distribute and collect the largest possible number of questionnaires in an effort to get the views of a diverse set of respondents in terms of economic sectors and the size ranges of companies; the researcher's success in achieving an acceptable sample size is judged against sample sizes in similar studies from the literature. Based upon this criterion, the researcher was reasonably satisfied that a large enough sample was obtained since the 45 questionnaires returned was more than the number of responses achieved by AlObeidi (1985) and AlWakil (2000).

The third limitation relates to the veracity of the replies received in the questionnaires and interviews; to what extent did the participants accurately represent the capital investment appraisal practices within the companies in which they worked? The sample was designed to ascertain companies' viewpoints with each interview or questionnaire reflecting the perspective of one organisation. However, including the outsider group in the first phase of the empirical work provided an indication of whether or not there was any bias in the replies of those supplying the companies' perspective. The outsider group included three sub-groups: the academics, bankers and chartered accountants. Apart from the academics,

all the other outsider sub-groups had professional experience which allowed them to offer insights about the current practice of capital investment appraisal in Libyan companies.

The fourth limitation relates to the time in which the study was conducted; during the years 2009/2010 the country was going through a long-term economic reform process which started in the early 1990s. This reform process was mainly aimed at building up the private sector, encouraging local entrepreneurs to be involved in the development of diverse Libyan economic sectors and attracting foreign investors to invest in the Libyan market. Consequently, the evidence from this study represents the perceptions of the participants about the current capital investment appraisal practices in Libyan companies after this ongoing economic reform had progressed for several years. Thus, it represents a snapshot in time about investment appraisal within Libya. Further, since this work has been undertaken, the country has been through an "Arab Spring" uprising which has altered the political and economic landscape in very dramatic ways (USpolicy, 2013). Thus, the perceptions of those who answered the questionnaire or gave interviews may have altered since the research was conducted. These limitations should be taken into consideration when using the finding of this thesis to evaluate Libyan companies' capital investment appraisal practices.

7.4 Contribution to Knowledge and Applications

Overall, this thesis has a number of limitations, which have been acknowledged by the researcher. Notwithstanding these limitations, the findings of the thesis are believed to represent a significant contribution to knowledge at two levels. First, it is

the first study of this scale in Libya; being an exploratory study in nature, it represents an important addition to the literature on the capital investment appraisal process in Libya. Second, the study contributes to the growing literature on investment appraisal in general; more specifically, the findings provide evidence on the state of current capital budgeting practice in one of the less developed countries that has largely been ignored in the literature. In addition, the study was designed to investigate issues wider than just the usage of appraisal techniques. It investigated other related issues, such as the importance of these techniques, the role of non-financial criteria in capital budgeting decisions, issues surrounding the incorporation of risk into investment appraisal and capital rationing. In addition, these issues are considered within a business environment affected by very radical changes (politically and economically) during the last four decades. This makes Libya an interesting context in which to consider issues associated with investment appraisal as the economy has moved from capitalism and free market values to socialism and communism values (Abouzkeh, 2012); all influenced by the ideology of the Libyan regime from 1969 to 2011.

Moreover, the investigation of the different perspectives held by such diverse groups of decision-makers inside and outside companies who are influential in either the choosing of a capital project (e.g. the CEOs) or providing funds (e.g. bankers) or who offer financial experience and advice relating to this kind of decision (e.g. chartered accountants) means that important insights have been obtained. It is important to highlight that these perspectives, have not been previously investigated in the Libyan business environment.

Therefore, this thesis adds to the overall picture about the practices of capital investment appraisal as well as the different perspectives of theorists (academics) on

this issue. Thus, it contributes to our understanding about how the capital investment appraisal process is implemented in a less developed country with a different environment and living with such extreme fundamental changes. The insights gleaned may also feed back into different theories about how companies should select investments in such circumstances.

Furthermore, this thesis might provide useful information for Libyan capital investment decision-makers, local investors as well as potential foreigner investors. It offers an objective evaluation about the existing practice of the capital investment appraisal from the perspective of different groups of decision-makers involved in capital budgeting decision-making both inside as well as outside companies. In addition, the findings of this thesis highlight the most important factors and criteria influencing the final capital investment decision, in reality, as practised within Libyan companies. Thus, it presents both professionals and academics with significant information that could be used in the development of capital investment processes in Libya. It also offers insights to regulators and Government authorities who may be keen to encourage corporate investment within the country. For example, local investors and foreign investors should take into account non-financial factors when they appraise capital investment in the Libyan economic environment. In the same context, regulators, instead of emphasising capital investment techniques to the exclusion of most other factors, should give more attention to non-financial criteria when they examine feasibility studies from investors applying for funding.

7.5 Future Research

The results from this study about Libyan companies should provide a basis for future research. Any such future research could be very important, especially as the

empirical section of this thesis was conducted shortly before the 2011 Libyan uprising, which led to a complete change in political regime. Clearly, it is to be expected that such an enormous change will have a significant effect on the Libyan economy in general and on the practices relating to capital investment appraisal in Libyan organisations in particular. It would be interesting to compare any future results with the findings of the current study to highlight any changes in Libyan firms' practices and perceptions relating to capital investment appraisal. Another focus for future research could be the employment of a different research method such as a case study to examine the issues discussed in the current thesis in more detail. This case study could focus on a number of capital investment projects from their start up to their post-completion audits, investigate these stages in depth, document what firms could usefully learn from this experience and finally examine how they may use this experience to improve their practice in future projects. Importantly, this thesis shows that Islamic financial products are new to the Libyan investment market. There may be useful opportunities to investigate the influence of this kind of funding on the practice of the capital investment appraisal in Libyan companies in the future.

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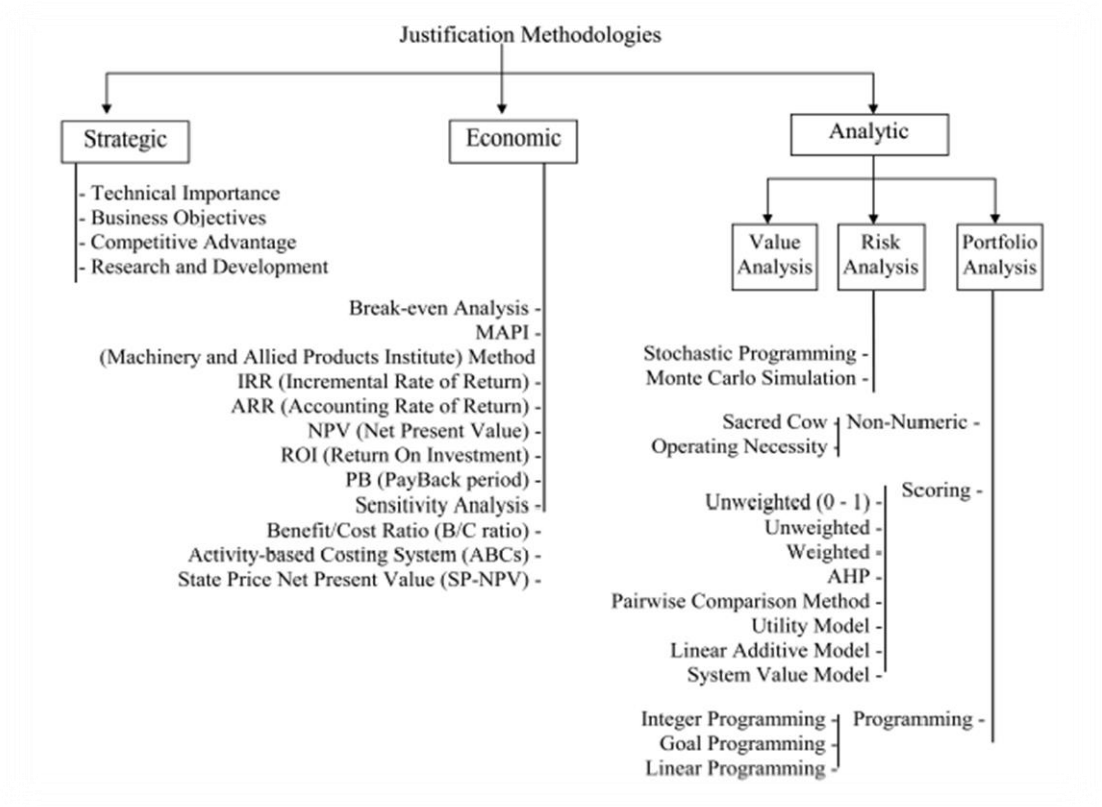
Appendix A

The Chan et.al. (2001) Framework

The following figure illustrates the different appraisal methodologies that can be used for the evaluation process of new investment and the framework that can be used:

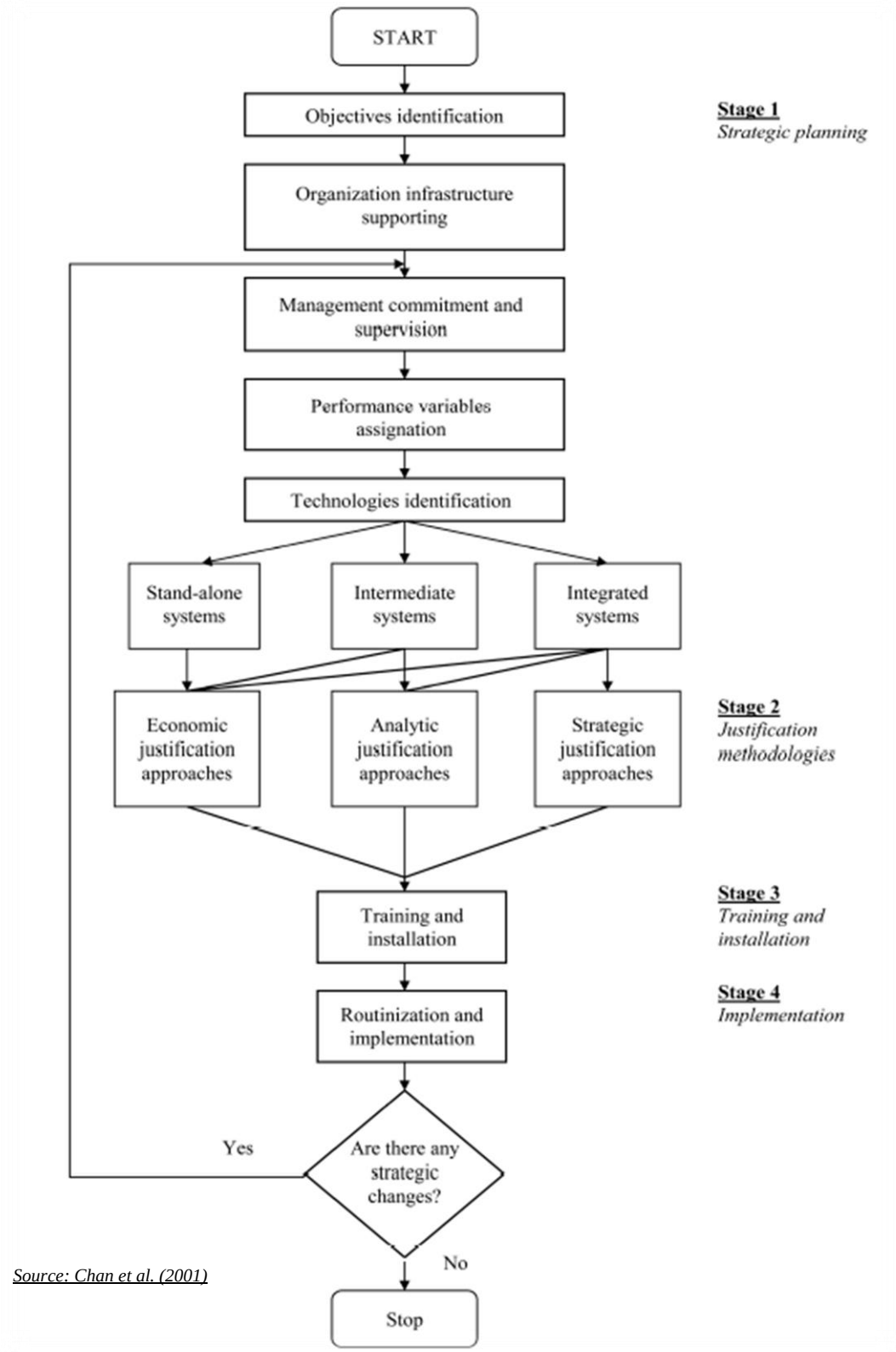
Figure 1



Source: Chan et al. (2001)

Figure 2

The Theoretical Framework



Source: Chan et al. (2001)

Appendix B

Semi-structured Interviews

Interviews Semi-structured Questions about

Investment Appraisal Techniques in Libya

By

Moftah M. A. Mohammed

PhD Student, School of Accounting and Finance, University of Dundee

December 2009

Participants: *Firms using funds.*

A: BACKGROUND INFORMATION:

Firm code: ……

Date of interview: ……

Position:

……..

Age Group: Less than 20years ☐ 20-30 years ☐ 31-40 years ☐
41-50 years ☐ over 50 years ☐

Educational qualification:		The Subject:	The place of graduation:
• Less than Bachelor Degree	☐	……	……..……
• Bachelor Degree ……	☐	……...…	…….
• Masters ….……	☐	……...……	……..……
• Doctorate ……	☐	..……..	…….
• Professional qualification…	☐	..……..	…….
• Others ……	☐	……	……..……..

Years of Experience in current position: ……

Main source of funding: Private Banks ☐ Government Bodies ☐
Financial ☐ Market
Other:…….....

Size of Firm: Capital: …… Employees: ……

B: Investment Context:

1(a) What is the impact of recent changes in the Libyan economic environment on the investment policy of firms in Libya?

(b) Does your firm have future plans to invest in new projects or expand existing projects? If yes, what is the probable source of funding for this investment?

C: Appraisal Techniques:

2 What techniques (PB, ARR, IRR, NPV, etc.) are used by your firm to appraise potential investments? Which is the main technique or combination of techniques used by your firm?

3 Do you think that investment appraisal techniques play a fundamental role in investment decisions or are there other factors included Non-financial criteria that override the results of these techniques? Can you suggest what these factors are? …

4 Does the size, the nature of the project and/or the funding source play an important role in determining the type of technique or the combination of techniques used in the investment appraisal process?

4* Do the fund providers, accountant practitioners and/or academic attempt to influence any of these matters?

D: Risk:

5 How do you select the discount rate (cost of capital) for investment appraisal proposal? Does the Islamic concept "Interest Free" of financing affect this selection?

6 Do you calculate an objective measurement of risk? If so, what methods do you use? If not, how do you assess risk subjectively?

6* Do the fund providers, accountant practitioners and/or academic attempt to influence any of these matters?

E: Procedure of Decision-Making and Control:

7 How many stages are there in your firm's investment decision-making process? *E.g. search & sources & screening of ideas, classification of proposals, proposal feasibility clearance, proposal evaluation, operational framework & budgeting control, and project post audit.*

8 Which of these stages are most important and which of these stages do you spend most time on?

9 Where do the ideas for an investment come from?

10 Do you have a post audit phase? If yes, how you do it? How long the post audit phase does continue for? ..

10* Do the fund providers, accountant practitioners and/or academic attempt to influence you to have similar to these stages and to have a post audit phase?

F: Capital Rationing:

11 Have you ever experienced a shortage of funding for any of the investments that you want to undertake (Capital Rationing)? If yes, how often?

12 Is any capital rationing imposed internally by management or is it due to external restrictions on getting funds at the current rate of interest?

13 If the rationing is imposed by management when they set a limit on the amount of investment that can be undertake, why do you think that this occurs?

14 Do you think that the development of the Libyan Stock Market will help to alleviate the external restrictions on the funding available for investment? How do you see the Stock Market helping your firm in the future?

G: Real Options (*Flexibility*) & Investing in AMT.

15 Do you consider the following options when undertaking an investment: *the option to **postpone** an investment, the option to **abandon** an investment, the option to **change the scale** of an investment, and the option to **change the technical nature** of an investment?*

16 When considering these options, do you undertake any formal analysis or are these options considered subjectively?

17 Does you firm plan to adopt any Advanced Manufacturing Technology (AMT) in the future? If yes, what kind of AMT investment in particular? *Computer Aided Design, Computer Control, Automated Material Handling, Computer Aided Manufacturing, Flexible Manufacturing System, or Computer Integrated Manufacturing?*

18 Do you use a specific appraisal technique and a specific source of funding for AMT investment?

18* Do the fund providers, accountant practitioners and/or academic attempt to influence you to use real options or AMT techniques?

19 Is there any another information you want to add, which was not covered by these interview questions?

أسئلةِ مقابلات حول تقنيات تقيمِ استثمارات في ليبيا

أعداد

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طالب دكتوراه , كلية المحاسبة والتمويل, جامعة دندي, بريطانيا

ديسمبير2009

المشاركون: الشركات التي تَستعملُ الأموال.

أ: معلومات أساسية:

تاريخ المقابلة:.....

الوظيفة :.....

الفئة العمرية : أقل من 20 سنة ☐ 30-20 ☐ 40-31 ☐ 50-41 ☐ أكثر من 50 سنة ☐

المؤهل العلمي :	**التخصص:**	**مكان التخرج:**
أقل من درجة البكالوريوس ..... ☐	.....	.....
البكالوريوس..... ☐	.....	.....
الماجستير..... ☐	.....	.....
الدكتوراه..... ☐	.....	.....
مؤهل مهني متخصص..... ☐	.....	.....
أخري ..... ☐	.....	.....

سنوات الخبرة في الوظيفة الحالية:.....

المصدر الرئيسي للتمويل: المصارف الخاصة ☐ المصرف و مؤسسات أخري مملوكة لدولة ☐

سوق الأوراق المالية ☐ مصادر أخري ☐

حجم الشركة: رأس المال: ..... عدد العاملين:.....

ب: الوضع العام للاستثمار:

1 أ ما هو تأثير التغيرات الأخيرة في البيئة الاقتصادية في ليبيا على السياسة الاستثمارية للشركات في ليبيا؟

ب هل لدى شريكتكم خطط مستقبلية للاستثمار في مشاريع جديدة أو توسيع المشاريع القائمة؟ إذا كان الجواب نعم، فما هو المصدر المحتمل لتمويل هذا الاستثمار؟

ج: تقنيات التقييم:

2 ما هي التقنيات المستخدمة من قبل شريكتكم لتقييم الاستثمارات المحتملة(صافي القيمة الحالية (NPV), فترة الاسترداد (PB), معدل العائد الداخلي (IRR), معدل العائد المحاسبي (ARR), الخ)؟ و ما هو الطريقة أو مجموعة الطرق الرئيسية المستخدمة من قبل شريكتكم؟

3 هل تعتقد أن تقنيات التقييم الاستثماري تلعب دورا أساسيا في قرارات الاستثمار، أم أن هناك عوامل أخرى بما في ذلك المعايير غير المالية التي قد تؤدي إلي تجاهل نتائج هذه التقنيات؟ هل من الممكن أن تذكر بعض هذه العوامل؟

4 هل حجم, طبيعة المشروع و/أو مصدر التمويل تلعب دورا هاما في تحديد نوع الطريقة أو مزيج الطرق المستخدمة في تقييم عملية الاستثمار؟

5 هل الممولين, المحاسبين الممارسين و/أو الأكاديميين يحاولون التأثير على أي من هذه الأمور؟

د: المخاطرة:

6 كيف تقومون بتحديد سعر الخصم (تكلفة رأس المال) لتقييم الاستثمار المقترح؟ هل المفهوم الإسلامي للتمويل "بدون فوائد" له تأثير على هذا الاختيار؟

7 هَلْ تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ؟ إذا كان الأمر كذلك، ما هي الطرق المستعملُة؟ إذا كان الجواب لا، فا كَيفَ تقومون بتقييم المخاطرة بشكل شخصي؟

8 هل الممولين, المحاسبين الممارسين و/أو الأكاديميين يحاولون التأثير على أي من هذه الأمور؟

هـ: مراحل اتخاذ القرار و المتابعة:

9 كم عدد المرحل الموجدة في عملية اتخاذ القراراتِ الاستثمارية في شركتِكمِ؟ *على سبيل المثال: – مرحلية البحث عن الأفكارِ وفحصها، تصنيف المشروعات المقترحة، توضيح الجدوى لاقتصادية للمشروعات المقترحة، تقييم المشروعات المقترحة، وضع الإطار العملي للتنفيذ ومتابعة موازنة، و متابعة المشروع بعد التنفيذ.*

10 ما هي المرحلة الأكثر أهمية في هذه المراحلِ ً وأي من هذه المراحلِ تستغرق أكثر الوقتِ لدراستها؟

11 من أين تأتي أفكار الاستثمارات الجديدة, في العادي ؟

12 هل لديك مرحلة لمتابعة للمشروعات الجديدة ما بعد التنفيذ (post audit phase) ؟ إذا كان الجواب نعم ، كيف تقومون بذلك؟ وكم من الوقت تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

13 هل الممولين, المحاسبين الممارسين و/أو الأكاديميين يحاولون التأثير عليكم لكي تتبعون هذه المراحل أو مراحل شبيها لها وكذلك لكي يكون لديكم مرحلة لمتابعة المشروعات ما بعد التنفيذ؟

و: تقنين (ترشيد, تقييد) رأس المال (Capital Rationing):

14 هل واجهة شريكتكم نقصا في التمويل لأي من الاستثمارات التي ترغب في تنفيذها **(Capital Rationing)**؟ إذا كان الجواب نعم، غالبا كم مرة حدث ذلك؟

15 هل كان هذا التقنين (التقييد) لرأس المال مفروض داخليا من قبل إدارة الشركة, أم أنه بسبب القيود الخارجية المفروضة على حصول الشركة على الأموال الأزمة لتمويل المشروعات الجديدة بسعر الفائدة الجاري؟

16 إذا كان التقنين تم فرضه بواسطة الإدارة عن طريق وضع حدود أو قيود على كمية رأس المال الممكن استثماره في المشروعات الجديدة، في اعتقادك ما هوا السبب أو الأسباب ورأى قيام الإدارة بذلك؟

17 هل تعتقد أن تطوير سوق الأوراق المالية الليبي سوف يساعد على التخفيف من القيود المفروضة على التمويل المتاح للاستثمار من خارج الشركة؟ كيف ترى إمكانية مساعدة سوق الأوراق المالية الليبي لشركتك في المستقبل؟

ز: المرونة(Flexibility) (الخيارات الحقيقية المتاحةReal Options) و الاستثمار في تقنيات التصنيع المتقدمة(AMT):

18 هل تأخذون بعين الاعتبار الخيارات التالية عند القيام بالاستثمار: الخيار لتأجيل الاستثمار(postpone), الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

19 عند اخذ هذه الخيارات بعين الاعتبار، هل تقومون بإجراء أي تحليل أو دراسات رسمية أو انه يتم النظر في هذه الخيارات بشكل شخصي؟

20 هل لدى الشركة خطة لاعتماد تقنيات تصنيع متقدم (**AMT**) في المستقبل؟ إذا كان الجواب نعم ، فما هو نوع هذه التقنيات على وجه الخصوص؟ *على سبيل المثال: التصميم بمساعدة الحاسوب ، التحكم بالحاسب الآلي, المناولة المواد الآلية, التصنيع بمساعدة الكمبيوتر ، نظام التصنيع المرن ، أو التصنيع الكامل بالكمبيوتر.*

21 هل تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات (**AMT**)؟

22 هل الممولين, المحاسبين الممارسين و/أو الأكاديميين يحاولون التأثير عليكم لكي تأخذون بعين الاعتبار مثل هذه الخيارات**(Real Options)** أو استعمال تقنيات التقييم الخاصة بـ (**AMT**)؟

23 هل هناك أي معلومات أخرى تريد إضافتها، والتي لم تشملها أسئلة هذه المقابلة؟

Interviews Semi-structured Questions about

Investment Appraisal Techniques in Libya

By

Moftah M. A. Mohammed

PhD Student, School of Accounting and Finance, University of Dundee

December 2009

Participant: *Chartered Accountant*.

A: BACKGROUND INFORMATION:

Date of interview: ……

Age Group: Less than 20years ☐ 20-30 years ☐ 31-40 years ☐
41-50 years ☐ over 50 years ☐

Educational qualification:	The Subject:	The place of graduation:
• Less than Bachelor Degree ☐	……	……..……
• Bachelor Degree …… ☐	……...…	…….
• Masters …..…… ☐	……...……	……..……
• Doctorate …… ☐	..……..	…….
• Professional qualification .. ☐	..……..	…….
• Others …… ☐	……	……..……..

Years of Experience: …….

B: Investment Context:

1 What is the impact of recent changes in the Libyan economic environment on the investment policy of firms in Libya?

C: Appraisal Techniques:

2(a) What techniques (PB, ARR, IRR, NPV, etc.) do you think the Libyan firm use to appraise potential investments? Which is the main technique or combination of techniques are used?

(b) Which techniques do you think they should use? ..

(c) Do you think that the Libyan accountancy profession can influence the firms to use particular techniques?

3(a) Do you think that investment appraisal techniques play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that override the results of these techniques? Can you suggest what these factors are?

(b) Do you think that investment appraisal techniques should play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that should override the results of these techniques if that are necessary? Can you suggest what these factors should be?

(c) Do you think that the Libyan accountancy profession can influence any of these matters?

4(a) Do you think the size, the nature of the project and/or the funding source play an important role in determining the type of technique or the combination of techniques used in the investment appraisal process?

(b) Do you think different techniques should be used for a different project based on the project size, nature and/or the funding source?

(c) Do you think that the Libyan accountancy profession can influence the firms to use different techniques for different size projects?

D: Risk:

5(a) How do you think Libyan firms select the discount rate (cost of capital) for investment appraisal proposal? Does the Islamic concept of "Interest Free" financing affect this selection?

(b) How do you think Libyan firms should select the discount rate? Do you think they should consider the Islamic concept of "Interest Free"?

(c) Do you think that the Libyan accountancy profession can influence them in their selection of a discount rate?

6(a) Do you think Libyan firms calculate an objective measurement of risk? If so, what methods do they use? If not, how do you think they assess risk subjectively?

(b) Do you think they should calculate an objective measurement of risk or assess risk subjectively? What methods do you think they should use?

(c) Do you think that the Libyan accountancy profession can influence firms in their measurement of risk?

E: Procedure of Decision-Making and Control:

7(a) How many stages do you think Libyan firms usually have in their investment decision-making process? *E.g. search & sources & screening of ideas, classification of proposals, proposal feasibility clearance, proposal evaluation, operational framework & budgeting control, and project post audit*

(b) How many stages do you think Libyan firms should have in their investment decision-making process?

(c) Do you think that the Libyan accountancy profession can influence the firms to employ these stages?

8(a) Which of these stages do you think Libyan firms consider it as the most important? Which of these stages do you think Libyan firms spend most time on?

(b) Which of these stages do you think Libyan firms should consider it as the most important? Which of these stages do you think Libyan firms should spend most time on?

(c) Do you think that the Libyan accountancy profession can influence the firms to change their views on this matter?

9(a) Where do you think Libyan firms' ideas for an investment come from?

(b) Where do you think Libyan firms' ideas for an investment should come from?

(c) Do you think that the Libyan accountancy profession can influence the firms to do so?

10(a) Do you think Libyan firms conduct the post audit phase? If yes, how do you think they do it? How long do you think the does continue for?

(b) Do you think Libyan firms should have a post audit phase? If yes, how do you think they should do it? How long do you think the post audit phase should continue for?

(c) Do you thank the Libyan accountancy profession can influence them to do so?

F: Capital Rationing:

11 Do you think Libyan firms ever experience a shortage of funding for any of the investments that you want to undertake (Capital Rationing)? If yes, how often?

12 Do you think capital rationing imposed internally by management or is it due to external restrictions on getting funds at the current rate of interest?

13 If the rationing is imposed by management when they set a limit on the amount of investment that can be undertake, why do you think they do so?

14 Do you think that the development of the Libyan Stock Market will help Libyan firms by alleviate the external restrictions on the funding available for Libyan firms to invest in the future?

G: Real Options (*Flexibility*) & Investing in AMT.

15(a) Do you think Libyan firms consider the following options when undertaking an investment: *the option to **postpone** an investment, the option to **abandon** an investment, the option to **change the scale** of an investment, and the option to **change the technical nature** of an investment* **?**

(b) Do you think Libyan firms should consider these options when undertaking an investment?

(c) Do you thank the Libyan accountancy profession can influence them to do so?

16(a) When they are considering these options, do you think they undertake any formal analysis or are they considering these options subjectively?

(b) When they are considering these options, do you think they should undertake any formal analysis or are they should considering these options subjectively?

(c) Do you thank the Libyan accountancy profession can influence them to do so?

17(a) Do you know if Libyan firms have plans to adopt any Advanced Manufacturing Technology (AMT) in the future? If yes, what kind of AMT investment in particular? *Computer Aided Design, Computer Control, Automated Material Handling, Computer Aided Manufacturing, Flexible Manufacturing System, or Computer Integrated Manufacturing?*

(b) Do you think Libyan firms should consider that to plan to adopt any AMT in the future? If yes, what kind of AMT investment in particular?

(c) Do you thank the Libyan accountancy profession can influence them to do so?

18(a) Do you think Libyan firms use a specific appraisal technique and a specific source of funding for AMT investment?

(b) Do you think Libyan firms should use a specific appraisal technique and a specific source of funding for AMT investment?

(c) Do you thank the Libyan accountancy profession can influence them to do so?

19 Is there any another information you want to add, which was not covered by these interview questions?

أسئلةِ مقابلات حول تقنيات تقيمِ استثمارات في ليبيا

أعداد

مفتاح محمد عامر محمد

طالب دكتوراه , كلية المحاسبة والتمويل, جامعة دندي, بريطانيا

ديسمبر 2009

المشاركون: المحاسبين الممارسين.

أ: معلومات أساسية:

تاريخ المقابلة:.....

الفئة العمرية : أقل من 20 سنة ☐ 30-20 ☐ 40-31 ☐ 50-41 ☐ أكثر من 50 سنة ☐

المؤهل العلمي :	**التخصص:**	**مكان التخرج:**
أقل من درجة البكالوريوس .... ☐	.....	.....
البكالوريوس..... ☐	.....	.....
الماجستير..... ☐	.....	.....
الدكتوراه..... ☐	.....	.....
مؤهل مهني متخصص..... ☐	.....	.....
أخري ..... ☐	.....	.....

سنوات الخبرة:.....

ب: الوضع العام للاستثمار:

1 ما هو تأثير التغيرات الأخيرة في البيئة الاقتصادية في ليبيا على السياسة الاستثمارية للشركات في ليبيا؟

ج: تقنيات التقييم:

2(أ) ما هي التقنيات المستخدمة من قبل الشركات الليبية لتقييم الاستثمارات المحتملة(صافي القيمة الحالية (NPV), فترة الاسترداد (PB), معدل العائد الداخلي (IRR), معدل العائد المحاسبي (ARR), الخ)؟ و ما هو الطريقة أو مجموعة الطرق الرئيسية المستخدمة من قبل الشركات؟

(ب) في اعتقادك ما هي التقنيات التي ينبغي عليهم استخدامها؟

(ج) هل تعتقد أن مهنة المحاسبة في ليبيا يمكن أن تؤثر على في الشركات لدفعها لاستخدام تقنيات معينة؟

3(أ) هل تعتقد أن تقنيات التقييم الاستثماري تلعب دوراً أساسيا في قرارات الاستثمار في الشركات الليبية، أم أن هناك عوامل أخرى بما في ذلك المعايير غير المالية التي قد تؤدي إلي تتجاهل نتائج هذه التقنيات؟ هل من الممكن أن تذكر بعض هذه العوامل؟

(ب) هل تعتقد أن تقنيات التقييم الاستثماري ينبغي أن تلعب دوراً أساسيا في قرارات الاستثمار في الشركات؟

(ج) هل تعتقد أن مهنة المحاسبة في ليبيا يمكن أن تؤثر في أي من هذه الأمور؟

4(أ) هل حجم, طبيعة المشروع و/أو مصدر التمويل تلعب دورا هاما في تحديد نوع الطريقة أو مزيج الطرق المستخدمة في تقييم عملية الاستثمار في الشركات الليبية؟

(ب) هل تعتقد أن تقنيات مختلفة ينبغي استخدامها لتقييم المشاريع المختلف استنادا إلى حجم المشروع ، طبيعته و/أو مصدر التمويل؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لاستعمال تقنياتِ مختلفةِ لمشروعات ذات أحجامِ مختلفةً؟

د: المخاطرة:

5(أ) في اعتقادك كيف تقوم الشريكات الليبية بتحديد سعر الخصم (تكلفة رأس المال) لتقييم الاستثمار المقترح؟ هل المفهوم الإسلامي للتمويل

"بدون فوائد" له تأثر على هذا الاختيار؟

(ب) في اعتقادك كيف ينبغي على الشركات الليبية أن تحدد سعر الخصم؟ هل تعتقد أنهم ينبغي أن يأخذون بعين الاعتبار المفهوم الإسلامي للتمويل "بدون فوائد"؟

(ج) هل تعتقد أن مهنةَ المحاسبةِ في ليبيا يمكن أن يؤثر عليهم في اختيار سعر الخصم؟

6(أ) في اعتقادك هَلْ الشركات الليبية تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ؟ إذا كان الأمر كذلك، ما هي الطرق المستعملُة؟ إذا كان الجواب لا، في اعتقادك كَيفَ تقوم الشركات الليبية بتقييم المخاطرة بشكل شخصي؟

(ب) في اعتقادك هَلْ ينبغي علي الشركات الليبية أن تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ أو أنه عليهم فقط تقدير المخاطرة بشكل شخصي؟ إذا كان الأمر كذلك، في اعتقادك ما هي الطرق التي ينبغي استعمالها ؟

(ج) هل تعتقد أن مهنةَ المحاسبةِ في ليبيا يمكن أن يؤثر على الشركات في قياس المخاطر؟

هـ: مراحل اتخاذ القرار و المتابعة:

7(أ) في اعتقادك كم عدد المرحل الموجدة في عملية اتخاذ القراراتِ الاستثمارية في الشركات الليبية؟ *على سبيل المثال: – مرحلية البحث عن الأفكارِ وفحصها، تصنيف المشروعات المقترحة، توضيح الجدوى لاقتصادية للمشروعات المقترحة، تقييم المشروعات المقترحة، وضع الإطار العملي للتنفيذ ومتابعة موازنة، و متابعة المشروع بعد التنفيذ.*

(ب) في اعتقادك كم عدد المراحل التي ينبغي علي الشركات الليبية أَنْ يكونَ لديها في عملية اتخاذ القراراتِ استثمارهم؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ استخدام هذه المراحل؟

8(أ) في اعتقادك أي من هذه المراحلِ التي تَعتبرُها الشركاتِ الليبيةِ الأكثر أهميةً؟ أي من هذه المراحلِ التي تَقْضي شركاتَ ليبيةَ أكثر الوقتِ في دراستها؟

(ب) في اعتقادك أي من هذه المراحلِ التي ينبغي على الشركاتِ الليبيةِ أن تَعتبرُها الأكثر أهميةً؟و أي من هذه المراحلِ التي ينبغي علي شركاتَ الليبيةَ أن تَقْضي أكثر الوقتِ في دراستها؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لتغيير وجهت نظرهم بشأن هذه الأمور؟

9(أ) في اعتقادك من أين تحصل الشركات الليبية علي أفكار الاستثمارات الجديدة؟

(ب) في اعتقادك من أين ينبغي علي الشركات الليبية أن تحصل علي أفكار الاستثمارات الجديدة؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لعَمَل ذلك؟

10(أ) هل تعتقد أن الشركات الليبية تقوم بعملية المتابعة ما بعد التنفيذ للمشروعات الجديدة(post audit phase)؟ إذا كان الجواب نعم، في اعتقادك كيف يقومون بذلك؟ و في اعتقادك كم من الوقت تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

(ب) هل تعتقد أنه ينبغي على الشركات الليبية أن تقوم بعملية المتابعة ما بعد التنفيذ للمشروعات الجديدة(post audit phase)؟ إذا كان الجواب نعم، في اعتقادك كيف ينبغي عليهم أن يقومون بذلك؟ و في اعتقادك كم من الوقت ينبغي أن تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لعَمَل ذلك؟

و: تقنين (ترشيد, تقييد) رأس المال (Capital Rationing):

11 في اعتقادك هل تواجهه الشركات الليبية نقصا في التمويل لأي من الاستثمارات التي ترغب في تنفيذها **(Capital Rationing)**؟ إذا كان الجواب نعم، غالبا كم مرة حدث ذلك؟

12 هل تعتقد أن التقنين (التقييد) لرأس المال مفروض داخليا من قبل إدارة الشركة, أم أنه بسبب القيود الخارجية المفروضة على حصول الشركات الليبية على الأموال الأزمة لتمويل المشروعات الجديدة بسعر الفائدة الجاري؟

13 إذا كان التقنين تم فرضه بواسطة الإدارة عن طريق وضع حدود أو قيود على كمية رأس المال الممكن استثماره في المشروعات الجديدة، في اعتقادك ما هوا السبب أو الأسباب ورأى قيام الإدارة بذلك؟

14 هل تعتقد أن تطوير سوق الأوراق المالية الليبي سوف يساعد الشركات الليبية بالتخفيف من القيود المفروضة على التمويل المتاح للشركات الليبية للاستثمار في المستقبل؟

ز: المرونة(Flexibility) الخيارات الحقيقية المتاحة (Real Options) و الاستثمار في تقنيات التصنيع المتقدمة(AMT):

15(أ) هل تعتقد أن الشركات الليبية تأخذ بعين الاعتبار الخيارات التالية عند قيامها بالاستثمار: الخيار لتأجيل الاستثمار(postpone), الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

(ب) هل تعتقد أنه ينبغي علي الشركات الليبية أن تأخذ بعين الاعتبار الخيارات التالية عند قيامها بالاستثمار: الخيار لتأجيل الاستثمار(postpone) , الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لعَمَل ذلك؟

16(أ) عند اخذ هذه الخيارات بعين الاعتبار، هل تعتقد أن الشركات الليبية تقوم بإجراء أي تحليل أو دراسات رسمية أو أنهم ي يقومون بالنظر في هذه الخيارات بشكل شخصي؟

(ب) هل تعتقد أن الشركات الليبية ينبغي عليها النظر في هذه الخيارات عند القيام باستثمار؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لعَمَل ذلك؟

17(أ) هَلْ تعلم أن هناك أي شركات ليبية لديها خطط لتَبنّي أيّ من تقنية التصنيع المتقدّمةِ (**AMT**)في المستقبلِ؟ إذا كان الجواب نعم ، فما هو نوع هذه التقنيات على وجه الخصوص؟ *على سبيل المثال: التصميم بمساعدة الحاسوب ، التحكم بالحاسب الآلي, المناولة المواد الآلية, التصنيع بمساعدة الكمبيوتر ، نظام التصنيع المرن ، أو التصنيع الكامل بالكمبيوتر.*

(ب) هل تعتقد أن الشركات الليبية ينبغي أن تأخذ بعين الاعتبار التخطيط لاعتماد أي من (**AMT**) في المستقبل؟ إذا كان الجواب نعم، فما هو نوع هذه الاستثمارات (**AMT**) على وجه الخصوص؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لعَمَل ذلك؟

18(أ) هل تعتقد أن الشركات الليبية تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات (**AMT**)؟

(ب) هل تعتقد أنه ينبغي على الشركات الليبية أن تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات؟

(ج) هَلْ تَعتقدُ بأنّ مهنةَ المحاسبةِ في ليبيا يُمْكِنُ أَنْ تُؤثّرَ على الشركاتِ لعَمَل ذلك؟

19 هل هناك أي معلومات أخرى تريد إضافتها، والتي لم تشملها أسئلة هذه المقابلة؟

Interviews Semi-structured Questions about

Investment Appraisal Techniques in Libya

By

Moftah M. A. Mohammed

PhD Student, School of Accounting and Finance, University of Dundee

December 2009

Participants: *Fund Providers.*

A: BACKGROUND INFORMATION:

Date of interview: ……

Position: ……

Age Group: Less than 20years ☐ 20-30 years ☐ 31-40 years ☐
41-50 years ☐ over 50 years ☐

Educational qualification:		The Subject:	The place of graduation:
• Less than Bachelor Degree	☐	……	……..……
• Bachelor Degree ……	☐	……...…	…….
• Masters ….……	☐	……...……	……..……
• Doctorate ……	☐	..……..	…….
• Professional qualification ..	☐	..……..	…….
• Others ……	☐	……	……..……..

Years of Experience in current position: ……

Size of Annual Investment (lending) Budget: …….....

Average of Acceptable Investment Project: ……

B: Investment Context:

1 What is the impact of recent changes in the Libyan economic environment on the investment policy of firms in Libya?

C: Appraisal Techniques:

2(a) What techniques (PB, ARR, IRR, NPV, etc.) do you think that Libyan firm use to appraise potential investments? Which is the main technique or combination of techniques are used?

(b) What technique do you think that they should use?

(c) Do you try to influence the firms to use particular techniques?

3(a) Do you think that investment appraisal techniques play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that override the results of these techniques? Can you suggest what these factors are?

(b) Do you think that investment appraisal techniques should play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that should override the results of these techniques if that are necessary? Can you suggest what these factors should be?

(c) Do you try to influence them to use the techniques to make their decision?

4(a) Do you think the size, the nature of the project and/or the funding source play an important role in determining the type of technique or the combination of techniques used in the investment appraisal process?

(b) Do you think different techniques should be used for a different project based on the project size, nature and/or the funding source?

(c) Do you try to influence them to use different techniques for different size projects?

D: Risk:

5(a) How do you think Libyan firms select the discount rate (cost of capital) for investment appraisal proposal? Does the Islamic concept of "Interest Free" financing affect this selection?

(b) How do you think Libyan firms should select the discount rate? Do you think they should consider the Islamic concept of "Interest Free"?

(c) Do you try to influence them to do so?

6(a) Do you think Libyan firms calculate an objective measurement of risk? If so, what methods do they use? If not, how do you think they assess risk subjectively?

(b) Do you think they should calculate an objective measurement of risk or assess risk subjectively? What methods do you think they should use?

(c) Do you try to influence them to do so?.

E: Procedure of Decision-Making and Control:

7(a) How many stages do you think Libyan firms usually have in their investment decision-making process? *E.g. search & sources & screening of ideas, classification of proposals, proposal feasibility clearance, proposal evaluation, operational framework & budgeting control, and project post audit.*

(b) How many stages do you think Libyan firms should have in their investment decision-making process?

(c) Do you try to influence them to do employ these stages?

8(a) Which of these stages do you think Libyan firms consider as the most important? Which of these stages do you think Libyan firms spend most time on?

(b) Which of these stages do you think Libyan firms should consider it as the most important? Which of these stages do you think Libyan firms should spend most time on?.

(c) Do you try to influence them to change their views in this matter?

9(a) Where do you think Libyan firms' ideas for an investment come from?

(b) Where do you think Libyan firms' ideas for an investment should come from?

(c) Do you try to influence them to do so?

10(a) Do you think Libyan firms conduct the post audit phase? If yes, how do you think they do it? How long do you think the does continue for?

(b) Do you think Libyan firms should have a post audit phase? If yes, how do you think they should do it? How long do you think the post audit phase should continue for?

(c) Do you try to influence them to do so?

F: Capital Rationing:

11 Do you think Libyan firms ever experience a shortage of funding for any of the investments that you want to undertake (Capital Rationing)? If yes, how often?

12 Do you think capital rationing imposed internally by management or is it due to external restrictions on getting funds at the current rate of interest?

13 If the rationing is imposed by management when they set a limit on the amount of investment that can be undertake, why do you think they do so?

14 Do you think that the development of the Libyan Stock Market will help Libyan firms by alleviate the external restrictions on the funding available for Libyan firms to invest in the future?

G: Real Options (*Flexibility*) & Investing in AMT.

15(a) Do you think Libyan firms consider the following options when undertaking an investment: *the option to **postpone** an investment, the option to **abandon** an investment, the option to **change the scale** of an investment, and the option to **change the technical nature** of an investment* **?**

(b) Do you think Libyan firms should consider these options when undertaking an investment?....

(c) Do you influence them to do so?

16(a) When they are considering these options, do you think they undertake any formal analysis or are they considering these options subjectively?

(b) When they are considering these options, do you think they should undertake any formal analysis or are they should considering these options subjectively?

(c) Do you try to influence them to do so?

17(a) Do you know Libyan firms have plan to adopt any Advanced Manufacturing Technology (AMT) in the future? If yes, what kind of AMT investment in particular? *Computer Aided Design, Computer Control, Automated Material Handling, Computer Aided Manufacturing, Flexible Manufacturing System, or Computer Integrated Manufacturing?*

(b) Do you think Libyan firms should consider that to plan to adopt any AMT in the future? If yes, what kind of AMT investment in particular?

(c) Do you try to influence them to do so?

18(a) Do you think Libyan firms use a specific appraisal technique and a specific source of funding for AMT investment?

(b) Do you think Libyan firms should use a specific appraisal technique and a specific source of funding for AMT investment?

(c) Do you try to influence them to do so?

19 Is there any another information you want to add, which was not covered by these interview questions?

أسئلةِ مقابلات حول تقنيات تقيمِ استثمارات في ليبيا

أعداد

مفتاح محمد عامر محمد

طالب دكتوراه , كلية المحاسبة والتمويل, جامعة دندي, بريطانيا

ديسمبر 2009

المشاركون: الممولين.

أ: معلومات أساسية:

تاريخ المقابلة:.....

الوظيفة :.....

الفئة العمرية : أقل من 20 سنة ☐ 30-20 ☐ 40-31 ☐ 50-41 ☐ أكثر من 50 سنة ☐

المؤهل العلمي :	**التخصص:**	**مكان التخرج:**
البكالوريوس..... ☐	.....	.....
الماجستير..... ☐	.....	.....
الدكتوراه..... ☐	.....	.....
مؤهل مهني متخصص..... ☐	.....	.....
أخري ..... ☐	.....	.....

سنوات الخبرة في الوظيفة الحالية:.....

حجم الموازنة السنوية للاستثمارات (الإقراض التجاري و الصناعي):.....

معدل حجم المشروع الاستثماري الممكن تمويله:.....

ب: الوضع العام للاستثمار:

1 ما هو تأثير التغيرات الأخيرة في البيئة الاقتصادية في ليبيا على السياسة الاستثمارية للشركات في ليبيا؟

ج: تقنيات التقييم:

2(أ) ما هي التقنيات المستخدمة من قبل الشركات الليبية لتقييم الاستثمارات المحتملة(صافي القيمة الحالية (NPV), فترة الاسترداد (PB), معدل العائد الداخلي (IRR), معدل العائد المحاسبي (ARR), الخ)؟ و ما هو الطريقة أو مجموعة الطرق الرئيسية المستخدمة من قبل الشركات؟

(ب) في اعتقادك ما هي التقنيات التي ينبغي عليهم استخدامها؟

(ج) هل تحاولون التأثير عليهم لاستعمال تقنيات محددة؟

3(أ) هل تعتقد أن تقنيات التقييم الاستثماري تلعب دوراً أساسيا في قرارات الاستثمار في الشركات الليبية، أم أن هناك عوامل أخرى بما في ذلك المعايير غير المالية التي قد تؤدي إلي تجاهل نتائج هذه التقنيات؟ هل من الممكن أن تذكر بعض هذه العوامل؟

(ب) هل تعتقد أن تقنيات التقييم الاستثماري ينبغي أن تلعب دوراً أساسيا في قرارات الاستثمار في الشركات الليبية؟

(ج) هَلْ تُحاولُون التَأثير عليهم لاستعمال هذه التقنياتِ لاتخاذ قرارِهم؟

4(أ) هل حجم, طبيعة المشروع و/أو مصدر التمويل تلعب دورا هاما في تحديد نوع الطريقة أو مزيج الطرق المستخدمة في تقييم عملية الاستثمار في الشركات الليبية؟

(ب) هل تعتقد أن تقنيات مختلفة ينبغي استخدامها لتقييم المشاريع المختلف استنادا إلى حجم المشروع ، طبيعته و/أو مصدر التمويل؟

(ج) هل تحاولون التأثير عليهم لاستخدام تقنيات مختلفة لمشاريع مختلفة الحجم؟

د: المخاطرة:

5(أ) في اعتقادك كيف تقوم الشريكات الليبية بتحديد سعر الخصم (تكلفة رأس المال) لتقييم الاستثمار المقترح؟ هل المفهوم الإسلامي للتمويل "بدون فوائد" له تأثر على هذا الاختيار؟

(ب) في اعتقادك كيف ينبغي على الشركات الليبية أن تحدد سعر الخصم؟ هل تعتقد أنهم ينبغي أن يأخذون بعين الاعتبار المفهوم الإسلامي للتمويل "بدون فوائد"؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

6(أ) في اعتقادك هَلْ الشركات الليبية تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ؟ إذا كان الأمر كذلك، ما هي الطرق المستعملُة؟ إذا كان الجواب لا، في اعتقادك كَيفَ تقوم الشركات الليبية بتقييم المخاطرة بشكل شخصي؟

(ب) في اعتقادك هَلْ ينبغي علي الشركات الليبية أن تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ أو أنه عليهم فقط تقدير المخاطرة بشكل شخصي؟ إذا كان الأمر كذلك، في اعتقادك ما هي الطرق التي ينبغي استعمالها ؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

هـ: مراحل اتخاذ القرار و المتابعة:

7(أ) في اعتقادك كم عدد المرحل الموجدة في عملية اتخاذ القراراتِ الاستثمارية في الشركات الليبية؟ *على سبيل المثال: – مرحلية البحث عن الأفكارِ وفحصها، تصنيف المشروعات المقترحة، توضيح الجدوى لاقتصادية للمشروعات المقترحة، تقييم المشروعات المقترحة، وضع الإطار العملي للتنفيذ ومتابعة موازنة، و متابعة المشروع بعد التنفيذ.*

(ب) في اعتقادك كم عدد المراحل التي ينبغي علي الشركات الليبية أَنْ يكونَ لديها في عملية اتخاذ القراراتِ استثمارهم؟

(ج) هل تحاولون التأثير عليهم القيام استخدام هذه المراحل؟

8(أ) في اعتقادك أي من هذه المراحلِ التي تَعتبرُها الشركاتِ الليبيةِ الأكثر أهميةً؟ أي من هذه المراحلِ التي تَقْضي شركاتَ ليبيةً أكثر الوقتِ في دراستها؟

(ب) في اعتقادك أي من هذه المراحلِ التي ينبغي على الشركاتِ الليبيةِ أن تَعتبرُها الأكثر أهميةً؟و أي من هذه المراحلِ التي ينبغي علي شركاتَ لليبيةَ أن تَقْضي أكثر الوقتِ في دراستها؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

9(أ) في اعتقادك من أين تحصل الشركات الليبية علي أفكار الاستثمارات الجديدة؟

(ب) في اعتقادك من أين ينبغي علي الشركات الليبية أن تحصل علي أفكار الاستثمارات الجديدة؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

10(أ) هل تعتقد أن الشركات الليبية تقوم بعملية المتابعة ما بعد التنفيذ للمشروعات الجديدة(post audit phase)؟ إذا كان الجواب نعم، في اعتقادك كيف يقومون بذلك؟ و في اعتقادك كم من الوقت تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

(ب) هل تعتقد أنه ينبغي على الشركات الليبية أن تقوم بعملية المتابعة ما بعد التنفيذ للمشروعات الجديدة(post audit phase)؟ إذا كان الجواب نعم، في اعتقادك كيف ينبغي عليهم أن يقومون بذلك؟ و في اعتقادك كم من الوقت ينبغي أن تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

و: تقنين (ترشيد, تقييد) رأس المال (Capital Rationing):

11 في اعتقادك هل تواجهه الشركات الليبية نقصا في التمويل لأي من الاستثمارات التي ترغب في تنفيذها **(Capital Rationing)**؟ إذا كان الجواب نعم، هل يحدث ذلك غالبا ؟

12 هل تعتقد أن التقنين (التقييد) لرأس المال مفروض داخليا من قبل إدارة الشركة, أم أنه بسبب القيود الخارجية المفروضة على حصول الشركات الليبية على الأموال الأزمة لتمويل المشروعات الجديدة بسعر الفائدة الجاري؟

13 إذا كان التقنين تم فرضه بواسطة الإدارة عن طريق وضع حدود أو قيود على كمية رأس المال الممكن استثماره في المشروعات الجديدة، في اعتقادك ما هوا السبب أو الأسباب ورأى قيام الإدارة بذلك؟

14 هل تعتقد أن تطوير سوق الأوراق المالية الليبي سوف يساعد الشركات الليبية بالتخفيف من القيود المفروضة على التمويل المتاح للشركات الليبية للاستثمار في المستقبل؟

ز: المرونة(Flexibility) الخيارات الحقيقية المتاحة(Real Options) و الاستثمار في تقنيات التصنيع المتقدمة(AMT):

15(أ) هل تعتقد أن الشركات الليبية تأخذ بعين الاعتبار الخيارات التالية عند قيامها بالاستثمار: الخيار لتأجيل الاستثمار(postpone), الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

(ب) هل تعتقد أنه ينبغي علي الشركات الليبية أن تأخذ بعين الاعتبار الخيارات التالية عند قيامها بالاستثمار: الخيار لتأجيل الاستثمار (postpone), الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

16(أ) عند اخذ هذه الخيارات بعين الاعتبار، هل تعتقد أن الشركات الليبية تقوم بإجراء أي تحليل أو دراسات رسمية أو أنهم ي يقومون بالنظر في هذه الخيارات بشكل شخصي؟

(ب) هل تعتقد أن الشركات الليبية ينبغي عليها النظر في هذه الخيارات عند القيام باستثمار؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

17(أ) هَلْ تعلم أن هناك أي شركات ليبية لديها خطط لتَبنّي أيّ من تقنية التصنيع المتقدّمةِ (**AMT**)في المستقبلِ؟ إذا كان الجواب نعم ، فما هو نوع هذه التقنيات على وجه الخصوص؟ *على سبيل المثال: التصميم بمساعدة الحاسوب ، التحكم بالحاسب الآلي, المناولة المواد الآلية, التصنيع بمساعدة الكمبيوتر ، نظام التصنيع المرن ، أو التصنيع الكامل بالكمبيوتر.*

(ب) هل تعتقد أن الشركات الليبية ينبغي أن تأخذ بعين الاعتبار التخطيط لاعتماد أي من (**AMT**) في المستقبل؟ إذا كان الجواب نعم، فما هو نوع هذه الاستثمارات (**AMT**) على وجه الخصوص؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

18(أ) هل تعتقد أن الشركات الليبية تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات (**AMT**)؟

(ب) هل تعتقد أنه ينبغي على الشركات الليبية أن تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات؟

(ج) هل تحاولون التأثير عليهم للقيام بذلك؟

19 هل هناك أي معلومات أخرى تريد إضافتها، والتي لم تشملها أسئلة هذه المقابلة؟

Interviews Semi-structured Questions about

Investment Appraisal Techniques in Libya

By

Moftah M. A. Mohammed

PhD Student, School of Accounting and Finance, University of Dundee

December 2009

Participants: *Academic.*

A: BACKGROUND INFORMATION:

Date of interview: ……

Age Group: Less than 20years ☐ 20-30 years ☐ 31-40 years ☐
41-50 years ☐ over 50 years ☐

Educational qualification:		The Subject:	The place of graduation:
• Less than Bachelor Degree …	☐	……	……..……
• Bachelor Degree ……	☐	……...…	……..
• Masters ….……	☐	……...……	…….……
• Doctorate ……	☐	..……..	…….
• Professional qualification….	☐	...……..	…….
• Others ……	☐	……	……..……..

Years of Experience:

B: Investment Context:

1 What is the impact of recent changes in the Libyan economic environment on the investment policy of Libya firms?

C: Appraisal Techniques:

2(a) What techniques (PB, ARR, IRR, NPV, etc.) do you think that Libyan firm use to appraise potential investments? Which is the main technique or combination of techniques used?

(b) Which techniques do you think that they should use?

(c) Do you think that the Libyan accounting education system influences the techniques which firms use?

3(a) Do you think that investment appraisal techniques currently play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that override the results of these techniques? Can you suggest what these factors are?

(b) Do you think that investment appraisal techniques should play a fundamental role in Libyan firms' investment decision-making or are there other factors including Non-financial criteria that should override the results of these techniques if necessary? Can you suggest what these factors should be?

(c) Do you think that the Libyan accounting education system can influence any of these matters?.

4(a) Do you think the size, the nature of the project and/or the funding source play an important role in determining the type of technique or the combination of techniques used in the investment appraisal process?

(b) Do you think different techniques should be used for a different project based on the project size, nature and/or the funding source?

(c) Do you think that the Libyan accounting education system influences Libyan firms to use different techniques for different size projects?

D: Risk:

5(a) How do you think that Libyan firms select the discount rate (cost of capital) for investment appraisal proposal? Does the Islamic concept of "Interest Free" financing affect this selection?

(b) How do you think Libyan firms should select the discount rate? Do you think that they should consider the Islamic concept of "Interest Free"?

(c) Do you think that the Libyan accounting education system can influence them in their selection of a discount rate?

6(a) Do you think Libyan firms calculate an objective measurement of risk? If so, what methods do you use? If not, how do you think they assess risk subjectively?

(b) Do you think they should calculate an objective measurement of risk or assess risk subjectively? What methods do you think they should use?

(c) Do you think that the Libyan accounting education system can influence firms in their measurement of risk?

E: Procedure of Decision-Making and Control:

7(a) How many stages do you think that Libyan firms usually go through in their investment decision-making process? *E.g. search & sources & screening of ideas, classification of proposals, proposal feasibility clearance, proposal evaluation, operational framework & budgeting control, and project post audit.*

(b) How many stages do you think Libyan firms should go through in their investment decision-making process?

(c) Do you think that the Libyan accounting education system influences Libyan firms in the number of stages that they consider in their investment decision-making process?

8(a) Which of these stages do you think Libyan firms consider it as the most important? Which of these stages do you think Libyan firms spend most time on?

(b) Which of these stages do you think Libyan firms should consider it as the most important? Which of these stages do you think Libyan firms should spend most time on?

(c) Do you thank the Libyan accounting education system can influence them to do so?

9(a) Where do you think Libyan firms' ideas for an investment come from?

(b) Where do you think Libyan firms' ideas for an investment should come from?

(c) Do you thank the Libyan accounting education system can influence them to do so?

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(b) Do you think Libyan firms should have a post audit phase? If yes, how do you think they should do it? How long do you think the post audit phase should continue for?

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F: Capital Rationing:

11 Do you think Libyan firms ever experience a shortage of funding for any of the investments that you want to undertake (Capital Rationing)? If yes, how often?

12 Do you think capital rationing imposed internally by management or is it due to external restrictions on getting funds at the current rate of interest? …

13 If the rationing is imposed by management when they set a limit on the amount of investment that can be undertake, why do you think they do so?

14 Do you think that the development of the Libyan Stock Market will help Libyan firms by alleviate the external restrictions on the funding available for Libyan firms to invest in the future?

G: Real Options (*Flexibility*) & Investing in AMT.

15(a) Do you think Libyan firms consider the following options when undertaking an investment: *the option to **postpone** an investment, the option to **abandon** an investment, the option to **change the scale** of an investment, and the option to **change the technical nature** of an investment* **?**

(b) Do you think Libyan firms should consider these options when undertaking an investment?

(c) Do you thank the Libyan accounting education system can influence them to do so?

16(a) When they are considering these options, do you think they undertake any formal analysis or

are they considering these options subjectively?

(b) When they are considering these options, do you think they should undertake any formal analysis or are they should considering these options subjectively?

(b) Do you thank Libyan accounting education system influence them to do so?

17(a) Do you know Libyan firms have plan to adopt any Advanced Manufacturing Technology (AMT) in the future? If yes, what kind of AMT investment in particular? *Computer Aided Design, Computer Control, Automated Material Handling, Computer Aided Manufacturing, Flexible Manufacturing System, or Computer Integrated Manufacturing?*

(b) Do you think Libyan firms should consider that to plan to adopt any AMT in the future? If yes, what kind of AMT investment in particular?

(c) Do you thank the Libyan accounting education system can influence them to do so?

18(a) Do you think Libyan firms use a specific appraisal technique and a specific source of funding for AMT investment?

(b) Do you think Libyan firms should use a specific appraisal technique and a specific source of funding for AMT investment?

(c) Do you thank the Libyan accounting education system can influence them to do so?

19 Is there any another information you want to add, which was not covered by these interview questions?

أسئلةِ مقابلات حول تقنيات تقيمِ استثمارات في ليبيا

أعداد

مفتاح محمد عامر محمد

طالب دكتوراه , كلية المحاسبة والتمويل, جامعة دندي, بريطانيا

ديسمبر 2009

المشاركون: الأكاديميين(أعضاء هيئة التدريس الجامعي).

أ: معلومات أساسية:

تاريخ المقابلة:.....

الفئة العمرية : أقل من 20 سنة ☐ 30-20 ☐ 40-31 ☐ 50-41 ☐ أكثر من 50 سنة ☐

المؤهل العلمي :	**التخصص:**	**مكان التخرج:**
بكالوريوس..... ☐	.....	.....
ماجستير ..... ☐	.....	.....
دكتوراه..... ☐	.....	.....
أخري ..... ☐	.....	.....

سنوات الخبرة:.....

ب: الوضع العام للاستثمار:

1 ما هو تأثير التغيرات الأخيرة في البيئة الاقتصادية في ليبيا على السياسة الاستثمارية للشركات في ليبيا؟

ج: تقنيات التقييم:

2(أ) ما هي التقنيات المستخدمة من قبل الشركات الليبية لتقييم الاستثمارات المحتملة(صافي القيمة الحالية (NPV), فترة الاسترداد (PB), معدل العائد الداخلي (IRR), معدل العائد المحاسبي (ARR), الخ)؟ و ما هو الطريقة أو مجموعة الطرق الرئيسية المستخدمة من قبل الشركات؟

(ب) في اعتقادك ما هي التقنيات التي ينبغي عليهم استخدامها؟

(ج) هل تعتقد أن نظام التعليم المحاسبي في ليبيا يمكن أن يؤثر على الشركات لدفعها لاستخدام تقنيات معينة؟

3(أ) هل تعتقد أن تقنيات التقييم الاستثماري تلعب دوراً أساسيا في قرارات الاستثمار في الشركات الليبية، أم أن هناك عوامل أخرى بما في ذلك المعايير غير المالية التي قد تجاهل نتائج هذه التقنيات؟ هل من الممكن أن تذكر بعض هذه العوامل؟

(ب) هل تعتقد أن تقنيات التقييم الاستثماري ينبغي أن تلعب دوراً أساسيا في قرارات الاستثمار في الشركات الليبية ؟

(ج) هل تعتقد أن نظام التعليم المحاسبي في ليبيا يمكن أن يؤثر في أي من هذه الأمور؟

4(أ) هل حجم, طبيعة المشروع و/أو مصدر التمويل تلعب دورا هاما في تحديد نوع الطريقة أو مزيج الطرق المستخدمة في تقييم عملية الاستثمار في الشركات الليبية؟

(ب) هل تعتقد أن تقنيات مختلفة ينبغي استخدامها لتقييم المشاريع المختلف استنادا إلى حجم المشروع ، طبيعته و/أو مصدر التمويل؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يُؤثّرَ على الشركاتِ لاستعمال تقنياتِ مختلفةِ لمشروعات ذات أحجامِ مختلفةَ؟

د: المخاطرة:

5(أ) في اعتقادك كيف تقوم الشريكات الليبية بتحديد سعر الخصم (تكلفة رأس المال) لتقييم الاستثمار المقترح؟ هل المفهوم الإسلامي للتمويل "بدون فوائد" له تأثر على هذا الاختيار؟

(ب) في اعتقادك كيف ينبغي على الشركات الليبية أن تحدد سعر الخصم؟ هل تعتقد أنهم ينبغي أن يأخذون بعين الاعتبار المفهوم الإسلامي للتمويل "بدون فوائد"؟

(ج) هل تعتقد أن نظام التعليم المحاسبي في ليبيا يمكن أن يؤثر عليهم في اختيار سعر الخصم؟

6(أ) في اعتقادك هَلْ الشركات الليبية تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ؟ إذا كان الأمر كذلك، ما هي الطرق المستعملُة؟ إذا كان الجواب لا، في اعتقادك كَيفَ تقوم الشركات الليبية بتقييم المخاطرة بشكل شخصي؟

(ب) في اعتقادك هَلْ ينبغي علي الشركات الليبية أن تقوم باستخدام مقياسَ موضوعيَ لقياسْ المخاطرةِ أو أنه عليهم فقط تقدير المخاطرة بشكل شخصي؟ إذا كان الأمر كذلك، في اعتقادك ما هي الطرق التي ينبغي استعمالها ؟

(ج) هل تعتقد أن نظام التعليم المحاسبة في ليبيا يمكن أن يؤثر على الشركات في قياس المخاطر؟

هـ: مراحل اتخاذ القرار و المتابعة:

7(أ) في اعتقادك كم عدد المرحل الموجدة في عملية اتخاذ القراراتِ الاستثمارية في الشركات الليبية؟ *على سبيل المثال: – مرحلية البحث عن الأفكارِ وفحصها، تصنيف المشروعات المقترحة، توضيح الجدوى لاقتصادية للمشروعات المقترحة، تقييم المشروعات المقترحة، وضع الإطار العملي للتنفيذ ومتابعة موازنة، و متابعة المشروع بعد التنفيذ.*

(ب) في اعتقادك كم عدد المراحل التي ينبغي علي الشركات الليبية أَنْ يكونَ لديها في عملية اتخاذ القراراتِ استثمارهم؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أن يؤثّرَ على الشركاتِ لاستخدام هذه المراحل؟

8(أ) في اعتقادك أي من هذه المراحلِ التي تَعتبرُها الشركاتِ الليبيةِ الأكثر أهميةً؟ أي من هذه المراحلِ التي تَقْضي شركاتَ ليبيةَ أكثر الوقتِ في دراستها؟

(ب) في اعتقادك أي من هذه المراحلِ التي ينبغي على الشركاتِ الليبيةِ أن تَعتبرُها الأكثر أهميةً؟و أي من هذه المراحلِ التي ينبغي علي شركاتَ الليبيةَ أن تَقْضي أكثر الوقتِ في دراستها؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يُؤثّرَ على الشركاتِ لتغيير وجهت نظرهم بشأن هذه الأمور؟

9(أ) في اعتقادك من أين تحصل الشركات الليبية علي أفكار الاستثمارات الجديدة؟

(ب) في اعتقادك من أين ينبغي علي الشركات الليبية أن تحصل علي أفكار الاستثمارات الجديدة؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يؤثّرَ على الشركاتِ في هذا الخصوص؟

10(أ) هل تعتقد أن الشركات الليبية تقوم بعملية المتابعة ما بعد التنفيذ للمشروعات الجديدة(post audit phase)؟ إذا كان الجواب نعم، في اعتقادك كيف يقومون بذلك؟ و في اعتقادك كم من الوقت تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

(ب) هل تعتقد أنه ينبغي على الشركات الليبية أن تقوم بعملية المتابعة ما بعد التنفيذ للمشروعات الجديدة(post audit phase)؟ إذا كان الجواب نعم، في اعتقادك كيف ينبغي عليهم أن يقومون بذلك؟ و في اعتقادك كم من الوقت ينبغي أن تستمر هذه المرحلة بعد أنتها تنفيذ المشروع؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يُؤثّرَ على الشركاتِ في هذا الخصوص؟

و: تقنين (ترشيد, تقييد) رأس المال (Capital Rationing):

11 في اعتقادك هل تواجهه الشركات الليبية نقصا في التمويل لأي من الاستثمارات التي ترغب في تنفيذها **(Capital Rationing)**؟ إذا كان الجواب نعم، هل يحدث ذلك غالبا ؟

12 هل تعتقد أن التقنين (التقييد) لرأس المال في العادة مفروض داخليا من قبل إدارة الشركة, أم أنه بسبب القيود الخارجية المفروضة على حصول الشركات الليبية على الأموال الأزمة لتمويل المشروعات الجديدة بسعر الفائدة الجاري؟

13 إذا كان التقنين تم فرضه بواسطة الإدارة عن طريق وضع حدود أو قيود على كمية رأس المال الممكن استثماره في المشروعات الجديدة، في اعتقادك ما هوا السبب أو الأسباب ورأى قيام الإدارة بذلك؟

14 هل تعتقد أن تطوير سوق الأوراق المالية الليبي سوف يساعد الشركات الليبية بالتخفيف من القيود المفروضة على التمويل المتاح للشركات الليبية للاستثمار في المستقبل؟

ز: المرونة(Flexibility) الخيارات الحقيقية المتاحة(Real Options) و الاستثمار في تقنيات التصنيع المتقدمة(AMT):

15(أ) هل تعتقد أن الشركات الليبية تأخذ بعين الاعتبار الخيارات التالية عند قيامها بالاستثمار: الخيار لتأجيل الاستثمار(postpone), الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

(ب) هل تعتقد أنه ينبغي علي الشركات الليبية أن تأخذ بعين الاعتبار الخيارات التالية عند قيامها بالاستثمار: الخيار لتأجيل الاستثمار (postpone), الخيار للتخلي عن الاستثمار(abandon), الخيار لتغيير حجم الاستثمار(change the scale) ، والخيار لتغيير الطابع التقني للاستثمار (change the technical nature)؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يُؤثّرَ على الشركاتِ في هذا الخصوص؟

16(أ) عند اخذ هذه الخيارات بعين الاعتبار، هل تعتقد أن الشركات الليبية تقوم بإجراء أي تحليل أو دراسات رسمية أو أنهم ي يقومون بالنظر في هذه الخيارات بشكل شخصي؟

(ب) هل تعتقد أن الشركات الليبية ينبغي عليها النظر في هذه الخيارات عند القيام باستثمار؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يُؤثّرَ على الشركاتِ في هذا الخصوص؟

17(أ) هَلْ تعلم أن هناك أي شركات ليبية لديها خطط لتَبنّي أيّ من تقنية التصنيع المتقدّمةِ (**AMT**)في المستقبلِ؟ إذا كان الجواب نعم ، فما هو نوع هذه التقنيات على وجه الخصوص؟ *على سبيل المثال: التصميم بمساعدة الحاسوب ، التحكم بالحاسب الآلي, المناولة المواد الآلية, التصنيع بمساعدة الكمبيوتر ، نظام التصنيع المرن ، أو التصنيع الكامل بالكمبيوتر.*

(ب) هل تعتقد أن الشركات الليبية ينبغي أن تأخذ بعين الاعتبار التخطيط لاعتماد أي من (**AMT**) في المستقبل؟ إذا كان الجواب نعم، فما هو نوع هذه الاستثمارات (**AMT**) على وجه الخصوص؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يؤثّرَ على الشركاتِ في هذا الخصوص؟

18(أ) هل تعتقد أن الشركات الليبية تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات (**AMT**)؟

(ب) هل تعتقد أنه ينبغي على الشركات الليبية أن تستخدم تقنيات محددة لتقييم ومصدرا محددة لتمويل هذا النوع من الاستثمارات؟

(ج) هَلْ تَعتقدُ بأنّ نظام التعليم المحاسبي في ليبيا يُمْكِنُ أَنْ يُؤثّرَ على الشركاتِ في هذا الخصوص؟

19 هل هناك أي معلومات أخرى تريد إضافتها، والتي لم تشملها أسئلة هذه المقابلة؟

Appendix C

Questionnaire Survey

Dear Participant

I am currently studying for a doctorate at the University of Dundee in the United Kingdom, under the supervision of Dr. Bruce Burton and Prof. David M Power. My research relates to the Investment Appraisal Process in firms which operating in Libya. The main objectives of the research are to investigate stages involved in the investment process and the techniques that are used by firms when deciding on a new investment project. I also plan to study the way in which risk is dealt with. In addition, the role of Islamic finance in the investment decision-making process is explored and the importance of the Libyan stock market as a source of funding is examined. The sample for the questionnaire has been chosen to cover a wide range of the economic sectors, ownership forms and firm sizes.

I very much welcome your views regarding the issues raised in this questionnaire. All information will be treated as confidential and will only be used for scientific research purposes; the names and positions of those participating in the questionnaire will not be disclosed.

I greatly appreciate your contribution to this research by completing the questionnaire.

Thank you in advance for participating in the project and responding to this questionnaire.

Moftah M A. Mohammed

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Questionnaire on the Investment Appraisal Process in Firms which Operating in Libya.

By

Moftah M. A. Mohammed

PhD Student, School of Accounting and Finance

University of Dundee

June/July 2010

Note: Please answer the questions by ticking ☑ the box and/or writing your answer in the gap.

SECTION A: BACKGROUND INFORMATION

The information in this section will be used for analytical purposes only

1- Your position in the firm: ……

2. Educational qualification: The Subject: The place of graduation:

- Less than Bachelor Degree…… ☐ …… ……
- Bachelor Degree …… ☐ ..……..... ……
- Masters …..……. ☐ ..……...….. ……..……
- Doctorate …….. ☐ ...…… ……
- Professional qualification…….. ☐ ...…… ……
- Others …… ☐ ...……. ……..……..…

3. Please indicate how many years you have been in your current position:

Less than5	5-Less10	10-Less15	15-Less19	Over 19
☐	☐	☐	☐	☐

4. Firm Sector: (Please state your firm's main area of business e.g. manufacturing, food, oil) ……

5. Please state the approximate size of your firm by capital: …… ….

6. What is the main source of your firm's capital?: (Please tick ☑ more than one box if necessary)

Private-Funding	Bank-loan	Government Bodies	Shares	Foreign Investor (partner)
☐	☐	☐	☐	☐

Other, please state: …….....

7. Please indicate the approximate number of employees in your firm: ……..…….

8. Does your firm have any plans to invest in new capital projects or expand existing projects in the near future?

Yes ☐ No ☐

If yes, what is the probable source of funding for this investment? (Please tick ☑ more than one if necessary)

Self-Funding	Banks	Government Bodies	Financial Market	Foreign Investor (partner)
☐	☐	☐	☐	☐

Other, please state: ……..…….

SECTION B: APPRAISAL TECHNIQUES

9. Please indicate how important each of the technique(s) shown in the list below are in your firm's investment appraising process:

Appraisal Technique	Completely Unimportant	Unimportant	Neutral	Important	Very Important
a) Payback (PB) …….....	☐	☐	☐	☐	☐
b) Discounted Pay back (DPB)……	☐	☐	☐	☐	☐
c) Net Present Value (NPV) ……	☐	☐	☐	☐	☐
d) Internal Rate of Return (IRR) …….	☐	☐	☐	☐	☐
e) Modified Internal Rate of Return (MIRR)...	☐	☐	☐	☐	☐
f) Accounting Rate of Return (ARR) ……..	☐	☐	☐	☐	☐
g) Profitability Index (PI)……..……..	☐	☐	☐	☐	☐
h) Other, please state: ..……..…….. ……..	☐	☐	☐	☐	☐

10. Please indicate how important each of the following non-financial criteria shown in the list below are in your firm's investment appraising process:

Non-financial Factor	Completely Unimportant	Unimportant	Neutral	Important	Very Important
Political Priorities of the State ..…….	☐	☐	☐	☐	☐
Development Plans of the State ……..	☐	☐	☐	☐	☐
Competitor Behaviour……	☐	☐	☐	☐	☐
Personal Experience ……..	☐	☐	☐	☐	☐
Social & Environmental Factors ……	☐	☐	☐	☐	☐
Other, please state: ……..…….. …….	☐	☐	☐	☐	☐

11. How important are the following project feature(s) in determining the type of technique or the combination of techniques used in the investment appraisal process?:

Project Feature	Completely Unimportant	Unimportant	Neutral	Important	Very Important
The Size of the Project ..……..	☐	☐	☐	☐	☐
The Nature of the Project ……...	☐	☐	☐	☐	☐
The Source of Funding ……..	☐	☐	☐	☐	☐
Other, please state: …….. ……	☐	☐	☐	☐	☐

SECTION C: RISK

12. Does your firm calculate its cost of capital?

Yes ☐ No ☐

If yes, please indicate the method(s) that use to calculate the cost of capital (discount rate):

(Please tick ☑ more than one if necessary)

Capital Asset Pricing Model (CAPM)……☐ Subjective judgment..... ☐

Dividend Growth Model……... ☐ Risk-free rate…..…… ☐

Weighted Average Cost of Capital (WACC)… ☐ Cost of debt (interest rate) ☐

Other, please state: …..……

13. Does your firm use different discount rates for different investment projects?

Yes ☐ No ☐

If yes, please briefly state the reason(s) why your firm uses different discount rates:

……

……..……

14. Does your firm assess the risk of potential investment projects?

Yes ☐ No ☐

If yes, please indicate how important the following method(s) are in assessing and dealing with risk for your firm?:

Method	Completely Unimportant	Unimportant	Neutral	Important	Very Important
a) Scenario Analysis……..	☐	☐	☐	☐	☐
b) Sensitivity Analysis……..	☐	☐	☐	☐	☐
c) Simulation (e.g. Monte Carlo)…….	☐	☐	☐	☐	☐
d) Break-even Analysis…….....	☐	☐	☐	☐	☐
e) Beta Analysis…….……....	☐	☐	☐	☐	☐
f) Decision Tree……	☐	☐	☐	☐	☐
g) Raising the Required Rate of Return.	☐	☐	☐	☐	☐
h) Shorten The Payback Period….....	☐	☐	☐	☐	☐
i) Subjective Assessment…….….....	☐	☐	☐	☐	☐
j) Other, please state : …….…..... ……..	☐	☐	☐	☐	☐

SECTION D: DECISION-MAKING PROCEDURE AND CONTROL

15. Please indicate how important the following stages are in your firm's investment decision-making process:

Stage	Completely Unimportant	Unimportant	Neutral	Important	Very Important
A) Determination of the Budget ……	☐	☐	☐	☐	☐
B) Search and Development ……..…	☐	☐	☐	☐	☐
C) Evaluation …….....	☐	☐	☐	☐	☐
D) Authorisation ……	☐	☐	☐	☐	☐
E) Monitoring and Control ……..….	☐	☐	☐	☐	☐

16. If the stages that your firm goes through when deciding on a capital investment are different, please briefly state them and indicate how important each of them in your firm's investment decision-making process:

Stage	Completely Unimportant	Unimportant	Neutral	Important	Very Important
A)……	☐	☐	☐	☐	☐
B) ……	☐	☐	☐	☐	☐
C) …….....	☐	☐	☐	☐	☐
D)…..…….……	☐	☐	☐	☐	☐
E) ……... ……...….	☐	☐	☐	☐	☐
F) ……. …….....	☐	☐	☐	☐	☐
G)……..…….....	☐	☐	☐	☐	☐

17. If your firm conducts ex-post audits of investment performance, please indicate how long it continues? How this audit takes place?:

	Less than 12 months	From 12 to 24 months	From 25 to 36 months	From 37 to 48 months	More than 48 months
How long it continues?.....	☐	☐	☐	☐	☐

How this ex-post audits phase takes place?:-

By comparing the performance after implementation with the predictions of the feasibility study in evaluation phase…… ☐

Just a regular following-up phase without comparing the performance after implementation with the predictions of the feasibility study in evaluation phase..... ☐

Other, please state: ……

SECTION E: CAPITAL RATIONING

18. How often has your firm experienced a shortage of funding for any of the investments that you wanted to undertake (i.e. Capital Rationing)?:

With all Investment projects	With most Investment projects	With some Investment projects	With a few Investment projects	Never
☐	☐	☐	☐	☐

19. Please indicate whether any capital rationing is imposed internally by management (Internal) or if it is due to restrictions on raising funds from banks or the financial market (External)?:

Internal ☐ External ☐

Please briefly state the reason(s) why capital rationing has occurred:

…….....

……

20. Do you think that the development of the Libyan Stock Market will help to alleviate external restrictions on the funding available for investment?:

Yes ☐ No ☐

If no, please briefly state the reason(s) for your answer: ……

……..……

……

21. Does your firm consider that the Libyan Stock Market will be a source of funding for your firm in the future?:

Yes ☐ No ☐

If yes, please indicate how your firm will use the stock market as a source of funding:

(Please tick ☑ more than one box if necessary)

Issuing new shares……. ☐

Issuing bonds…….. ☐

Offering part of the existing capital for public subscription…… ☐

SECTION F: ISLAMIC FINANCE:

22. Has your firm used Islamic Finance to fund investment projects previously?

Yes ☐ No ☐

If yes, what type(s) of Islamic financial products were used?: (Please tick ☑ more than one if necessary)

Murabahah ☐ Musharakah ☐ Rent To Own ☐ Sukuk (Islamic bonds) ☐

Other, please state: ……

23. Does your firm consider Islamic Finance as its preferred source of funding?

Yes ☐ No ☐

If yes, what are the reason(s) for this preference?: (Please tick ☑ more than one box if necessary)

Religious reasons…… ☐

To avoid paying interest ……..…..…… ☐

Risk sharing ……..…… ☐

The firm is looking for a partnership more than borrowing money…… ☐

Other, please state: …….

If no, please briefly state the reason(s): ……..…….

…….....

…….....

24. Briefly explain, what are the features may be influencing your firm to employ Islamic Finance for a potential investment project?: (e.g. project size, cash-flow pattern) …….

……

.....……

25. Are the investment appraisal techniques different for projects that employ Islamic Finance than for other projects?:

Yes ☐ No ☐

If yes, please briefly describe the techniques and indicate how they are different: ……

……

……

26. Is the evaluation of risk is different for a project that employs Islamic Finance than for other projects?:

Yes ☐ No ☐

If yes, please briefly describe the process and indicate how it is different: …….

……

……

SECTION G: GENERAL

27. Please indicate the extent to which the following group(s) attempts to influence your firm's investment decision-making process: (Please tick ☑ more than one box if necessary)

The Outsider groups	Always	Mostly	Often	Rarely	Never
Fund providers (e.g. Banks)……...	☐	☐	☐	☐	☐
Accountant Practitioners ……..	☐	☐	☐	☐	☐
Accounting and Financial Education	☐	☐	☐	☐	☐
Other, please state: ……	☐	☐	☐	☐	☐

……...

28. Are there any suggestions or comments that you may want to add about issues that were not raised by this questionnaire?

…….

……

……

……...……

……

Thank you for participating in the project and responding to this questionnaire.

Note:

If you would like to receive a copy of the summary finding, please provide the following details :

Name:

……

Address:

……

P.O.BOX:

……

Telephone:

……

Email:

……

أخي المُشارك الكريم.

تحية طيبة و بعد,,,,,,,,,,,,,,,,,

أنا مفتاح محمد عامر, عضو هيئة تدريس بجامعة قاريونس وأدرس حالياً بجامعة دندي في بريطانيا لنيل درجة الدكتوراه في تخصص التمويل، تحت إشراف الدكتور بروس بورتون والبروفيسور ديفيد باور. هذا البحث يختص بدراسة عملية تقييم الاستثمارات الرأسمالية في الشركات الليبي و تتمثل الأهداف الرئيسية للبحث في دراسة مراحل عملية الاستثمار وطرق تقييم الاستثمارات المستخدمة من قبل الشركات عند اتخاذ قرار بشأن مشروع استثماري جديد. كما يهدف البحث لدراسة الطرق التي يتم بواسطتها التعامل مع عامل المخاطرة. بالإضافة إلي استكشاف دور التمويل الإسلامي في عملية اتخاذ القرارات الاستثمارية وأهمية سوق الأوراق المالية الليبي كمصدر للتمويل. و روعيا في عينة الاستبيان تغطية مجموعة واسعة من القطاعات الاقتصادية ، أشكال الملكية و أحجام الشركات.

يسعدني كباحث أن أرحب بوجهات نظركم بشأن القضايا المثارة في هذا الاستبيان وسوف تعامل جميع المعلومات بمنتهى السرية وستستخدم فقط لأغراض البحث العلمي، ولن يتم الكشف عن أسماء ومناصب المشاركين في الاستبيان.

وفي الوقت الذي أقدر فيه كثيراً مساهمتكم الفاعلة في أنجاح هذه الدراسة, فإنه يسعدني أن أشكركم خالص الشكر و أتمنى لكم النجاح و التوفيق.

مفتاح محمد عامر محمد

عضو هيئة تدريس بجامعة قاريونس,

طالب دكتوراه في جامعة دندي في بريطانيا.

لأي استفسار الرجاء الاتصال علي الأرقام و العناوين التالية:

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استبيان حول عملية تقييم الاستثمارات في الشركات الليبية

إعداد

مفتاح محمد عامر محمد

طالب دكتوراه بكلية المحاسبة والمالية
جامعة دندي

يونيو / يوليو 2010 م

ملاحظة:

* يمكن الإجابة على الأسئلة بوضع علامة☑ في المربع و/أو كتابة الإجابة في الفراغ المخصص.

* للحصول على توضيح حول أي معلومة واردة في الاستبيان يمكن الرجوع إلي الملاحظات الملحقة في الصفحة رقم 8 و المرتبة حسب ترتيب الأسئلة, أو الاتصال لطلب التوضيح.

الجزء الأول : معلومات أساسية

أتعهد بان هذه المعلومات ستستخدم فقط لأغراض التحليل في ما يتعلق بالبحث العلمي.

2- الوظيفة في الشركة :.....

2. . **يرجى بيان المؤهل العلمي:** **التخصص:** **مكان التخرج:**

- أقل من درجة البكالوريوس .....☐ ....
- بكالوريوس .....☐ ....
- ماجستير .....☐ ....
- دكتوراه .....☐ ....
- دورة تخصصية .....☐ ....
- أخرى.....☐ ....

3. يرجى بيان عدد سنوات الخبرة في الوظيفة الحالية:

أقل من 5 ☐ **5- أقل من 10** ☐ **10- أقل من15** ☐ **15- أقل من 19** ☐

19 و أكثر ☐

4. يرجى بيان نشاط الشركة الرئيسي (مثلاً: التصنيع أو صناعات غذائية أو النفط).....

5. يرجى بيان الحجم التقريبي لرأسمال الشركة :.....

6. يرجى بيان المصدر الرئيسي لرأسمال الشركة: (يمكن وضع علامة ☑على أكثر من مربع واحد إذا لزم الأمر)

رأسمال خاص	**قروض مصارف**	**مؤسسات تابعة للدولة**	**أسهم**	**مستثمر أجنبي**	**(شريك)**
☐	☐	☐	☐	☐	

مصادر أخرى، يرجى ذكرها:.....

7. يرجى ذكر العدد التقريبي للعاملين في الشركة :.....

8. هل لدى شركتكم أي خطط للاستثمار في مشاريع رأسمالية جديدة أو توسيع المشاريع القائمة في المستقبل القريب؟

نعم	**لا**
☐	☐

إذا كانت الإجابة **نعم**، فما هو المصدر المحتمل لتمويل هذا الاستثمار؟: (يمكن وضع علامة ☑على أكثر من مربع واحد إذا لزم الأمر)

رأسمال خاص	قروض مصارف	مؤسسات تابعة للدولة	سوق الأوراق المالية	مستثمر (شريك) أجنبي
☐	☐	☐	☐	☐

مصادر أخرى، يرجى ذكرها:.....

الجزء الثاني: طرق تقييم الاستثمارآت

9. من فضلك حدد مدى أهمية كلاً من طرق التقييم الموضحة في الجدول أدناه في عملية تقييم المشاريع الاستثمارية (أنظر التوضيحات في الصفحة رقم 8.) الجديدة في شركتكم:

طرق التقييم	غير مهم بالكامل	غير مهم	محايد	مهم	مهم جداً
أ) فترة الاسترداد (Payback).....	☐	☐	☐	☐	☐
ب) فترة الاسترداد المخصومة (DPB)..... (أنظر التوضيحات في الصفحة رقم 8.)	☐	☐	☐	☐	☐
ج) صافي القيمة الحالية (NPV)	☐	☐	☐	☐	☐
د) معدل العائد الداخلي(IRR).....	☐	☐	☐	☐	☐
هـ) معدل العائد الداخلي المعدل (MIRR)..... (أنظر التوضيحات في الصفحة رقم 8.)	☐	☐	☐	☐	☐
و) معدل العائد المحاسبي (ARR)	☐	☐	☐	☐	☐
ز) مؤشر الربحية (PI)	☐	☐	☐	☐	☐
ح) طرق أخرى، يرجى ذكرها:.....	☐	☐	☐	☐	☐

10 . من فضلك حدد مدى أهمية كلاً من المعايير غير المالية الموضحة في الجدول أدناه في عملية تقييم المشاريع الاستثمارية الجديدة في شركتكم:

عامل غير مالي	غير مهم بالكامل	غير مهم	محايد	مهم	مهم جداً
الأولويات السياسية للدولة. (أنظر التوضيحات في الصفحة رقم 8.)	☐	☐	☐	☐	☐
خطط التنمية في الدولة(أنظر التوضيحات في الصفحة رقم 8.).....	☐	☐	☐	☐	☐
دواعي المنافسة. (أنظر التوضيحات في الصفحة رقم 8.).....	☐	☐	☐	☐	☐
الخبرة الشخصية.	☐	☐	☐	☐	☐
العوامل الاجتماعية والبيئية	☐	☐	☐	☐	☐
عوامل أخرى، ، يرجى ذكرها:	☐	☐	☐	☐	☐

11. ما هي أهمية المعيار أو المعايير الموضحة في الجدول التالي في تحديد الطريقة أو مجموعة الطرق المستخدمة في عملية تقييم المشاريع الاستثمارية الجديدة:

المعيار	غير مهم بالكامل	غير مهم	محايد	مهم	مهم جداً
حجم المشروع	☐	☐	☐	☐	☐
طبيعة المشروع	☐	☐	☐	☐	☐
مصدر التمويل	☐	☐	☐	☐	☐
معايير أخرى، يرجى ذكرها: .....……..….....	☐	☐	☐	☐	☐

……...……

الجزء الثالث : المخاطرة

12. هل تقوم شركتكم بحساب تكلفة رأس المال؟

نعم	لا
☐	☐

إذا كانت الإجابة **نعم**، يرجى ذكر الطريقة أو الطرق المستخدمة لحساب تكلفة رأس المال (سعر الخصم):

(يمكن وضع علامة ☑على أكثر من مربع واحد إذا لزم الأمر)

نموذج تسعير الأصول الرأسمالية (CAPM).....☐ تقدير شخصي .....☐

نموذج نمو ربح السهم (Dividend Growth Model) ☐ معدل العائد الخالي من المخاطرة.☐

(أنظر التوضيحات في الصفحة رقم 8.) (أنظر التوضيحات في الصفحة رقم 8.)

المتوسط المرجح لتكلفة لرأس المال (WACC) .....☐ تكلفة الدين (سعر الفائدة على القروض).....☐

(أنظر التوضيحات في الصفحة رقم 8.)

طرق أخرى، ، يرجى ذكرها: .....

13. هل تقوم شركتكم باستخدام معدلات (أسعار) خصم مختلفة لتقييم المشاريع الاستثمارية المختلفة؟

نعم	لا
☐	☐

إذا كانت الإجابة **نعم**، الرجاء أذكر باختصار الأسباب وراء استخدام شركتكم لمعدلات خصم مختلفة:

.....

.....

14. هل شركتكم تقوم بتقييم المخاطرة للمشاريع الاستثمارية المحتمل تنفيذها؟

نعم	لا
☐	☐

إذا كانت الإجابة **نعم**، يرجى الإشارة إلى مدى أهمية الأسلوب أو الأساليب التي تستخدم في التقييم والتعامل مع المخاطرة في شركتكم؟:

الطريقة	غير مهم بالكامل	غير مهم	محايد	مهم	مهم جداً
أ) تحليل السيناريو (Scenario Analysis)..... (أنظر التوضيحات في الصفحة رقم 8.)	☐	☐	☐	☐	☐
ب)تحليل الحساسية (Sensitivity Analysis).....	☐	☐	☐	☐	☐
ج) المحاكاة (Simulation e.g. Monte Carlo)... (أنظر التوضيحات في الصفحة رقم 8.)	☐	☐	☐	☐	☐
د) تحليل نقطة التعادل (Break-even Analysis) ...	☐	☐	☐	☐	☐
هـ) تحليل بيتا (Beta Analysis) ..... (أنظر التوضيحات في الصفحة رقم 8.)	☐	☐	☐	☐	☐
و) شجرة القرارات (Decision Tree)	☐	☐	☐	☐	☐
ز) رفع معدل العائد المطلوب	☐	☐	☐	☐	☐
ح) تقصير فترة الاسترداد	☐	☐	☐	☐	☐
ط) تقدير شخصي	☐	☐	☐	☐	☐
ي) طرق أخرى، يرجى ذكرها:	☐	☐	☐	☐	☐

الجزء الرابع : إجراءات عملية اتخاذ القرارات الاستثمارية وعملية الرقابة و المتابعة

15. من فضلك حدد مدى أهمية المراحل التالية في عملية اتخاذ القرارات الاستثمارية لدي شركتكم:

المرحلة	غير مهم بالكامل	غير مهم	محايد	مهم	مهم جداً
أ)تحديد الميزانية المخصصة للاستثمار	☐	☐	☐	☐	☐
ب)البحث والتطوير(البحث و تطوير الأفكار للاستثمارات الجديدة)	☐	☐	☐	☐	☐
ج)التقييم (الجدوى الاقتصادية للمشروع)	☐	☐	☐	☐	☐
د)التفويض و الاعتماد و التنفيذ	☐	☐	☐	☐	☐
هـ)المراقبة و المتابعة (أثناء التنفيذ و بعد التنفيذ وبدء التشغيل)	☐	☐	☐	☐	☐

16. في حالة وجود اختلاف في المراحل التي تمر بها شركتكم عند تقييم الاستثمارات الرأسمالية الجديدة عما ذكر في السؤال رقم 15، يرجى وباختصار وصف هذه المراحل بيان مدى أهمية كل مرحلة:

المرحلة	غير مهم بالكامل	غير مهم	محايد	مهم	مهم جداً
أ).....	☐	☐	☐	☐	☐
ب).....	☐	☐	☐	☐	☐
ج).....	☐	☐	☐	☐	☐
د).....	☐	☐	☐	☐	☐
هـ).....	☐	☐	☐	☐	☐
و).....	☐	☐	☐	☐	☐
ز).....	☐	☐	☐	☐	☐
ح).....	☐	☐	☐	☐	☐

17. إذا كانت شركتكم تطبق أسلوب مراجعة الأداء للمشاريع الاستثمارية بعد تنفيذها وبدء تشغيلها؟ كم من الوقت تستمر هذه المرحلة و كيف يتم القيام بها؟

	أقل من 12 شهر	من 12 إلي 24 شهر	من 25 إلي 36 شهر	من 37 إلي 48 شهر	أكثر من 48 شهر
كم من الوقت تستمر مرحلة مراجعة الأداء بعد التنفيذ؟ ..	☐	☐	☐	☐	☐

كيف يتم القيام بمرحلة مراجعة الأداء بعد التنفيذ ؟:-

أ)عن طريق مقارنة الأداء الفعلي بعد التنفيذ مع ما تم توقعه وتقديره في دراسة الجدوى الاقتصادية أثناء مرحلة التقييم للمشروع .....☐.

ب)عن طريق عملية المتابعة العادية حيث لا تتم عملية المقارنة بالتوقعات و التقديرات في دراسة الجدوى الاقتصادية أثناء مرحلة التقييم للمشروع. ☐

ج) طريقة أخرى، يرجى ذكرها: .....

الجزء الخامس : تقييد(تقنين) أو محدودية رأس المال (Capital Rationing)

18. من فضلك حدد مدى تعرض شركتكم لنقص في الأموال اللازمة لتنفيذ أي من المشاريع الاستثمارية التي ترغب في القيام بها (مثل التقييد أو التقنين لاستخدام رأس المال أو محدودية رأس المال)؟ :

في كل المشاريع الاستثمارية	في معظم المشاريع الاستثمارية	في بعض المشاريع الاستثمارية	في عدد قليل من المشاريع الاستثمارية	أبداً لم نواجه أي نقص في الأموال
☐	☐	☐	☐	☐

19. أذا كانت شركتكم في العادة تواجه تقييد أو محدودية في الأموال اللازمة للاستثمارات الجديدة, يرجى بيان ما إذا كان فرض هذا التقييد أو التقنين لرأس المال تم داخليا من قبل الإدارة (داخلي) أو انه بسبب القيود المفروضة على الحصول على الأموال من البنوك أو من سوق الأوراق المالية (خارجي)؟

داخلي	**خارجي**
☐	☐

الرجاء أذكر باختصار أسباب هذا التقييد أو التقنين أو محدودية رأس المال :.....

.....

.....

20. هل تعتقد أن تطوير سوق الأوراق المالية الليبي سوف يساعد على التخفيف من القيود الخارجية على الأموال المتاحة للاستثمار؟

نعم	**لا**
☐	☐

إذا كانت الإجابة **لا** , فالرجاء و باختصار بيان الأسباب : .....

.....

.....

21. هل شركتكم تعتبر أن سوق الأوراق المالية الليبي سيكون مصدراً لتوفير الأموال اللازمة للاستثمارات الجديدة في المستقبل؟

نعم	**لا**
☐	☐

إذا كانت الإجابة **نعم**، يرجى بيان الكيفية التي ستستخدم بها شركتكم سوق الأوراق المالية الليبي كمصدر للتمويل:

(يمكن وضع علامة ☑على أكثر من مربع واحد إذا لزم الأمر)

إصدار أسهم جديدة..... ☐

إصدار سندات..... ☐

عرض جزء من رأس المال الحالي للاكتتاب العام..... ☐

الجزء السادس: التمويل الإسلامي

22. هل استخدمت شركتكم التمويل الإسلامي لتمويل المشاريع الاستثمارية من قبل؟

نعم	**لا**
☐	☐

إذا كانت الإجابة **نعم**، أي نوع من طرق التمويل الإسلامية تم استخدامه ؟: (يمكن وضع علامة ☑على أكثر من مربع واحد إذا لزم الأمر)

المرابحة	**المشاركة**	**الإيجار ثم التملك**	**الصكوك (السندات الإسلامية)**
☐	☐	☐	☐

أخرى، الرجاء أذكرها: .....

23. هل تعتبر شركتكم التمويل الإسلامي المصدر المفضل لتمويل المشاريع الاستثمارية؟

نعم ☐ **لا** ☐

إذا كانت الإجابة **نعم**، فما هي أسباب هذا التفضيل؟: (يمكن وضع علامة ☑على أكثر من مربع واحد إذا لزم الأمر)

أسباب دينية .....☐

لتجنب دفع الفائدة .....☐

تقاسم المخاطرة .....☐

الشركة تبحث عن شراكة أكثر من اقتراض المال .....☐

أخرى، الرجاء أذكرها: .....

إذا كانت الإجابة **لا**, الرجاء أذكر باختصار الأسباب: .....

.....

24. يرجى وباختصار ذكر مميزات أو مواصفات المشاريع الاستثمارية والتي قد يكون لها تأثير على دفع شركتكم لاستعمال التمويل الإسلامي لتمويل هذه المشاريع الاستثمارية المحتملة؟ (على سبيل المثال: حجم المشروع, نمط التدفق النقدي) .....

.....

25. هل طرق التقييم للمشاريع الاستثمارية التي تستخدم التمويل الإسلامي مختلفة عن طرق التقييم للمشاريع الاستثمارية الأخرى؟

☐ **نعم** ☐ **لا**

إذا كانت الإجابة **نعم**، يرجى تقديم وصف موجز للطرق المستخدمة وبيان كيف أنها مختلفة عن الطرق الأخرى:

.....

.....

26.هل طرق تقييم المخاطرة للمشاريع الاستثمارية التي تستخدم التمويل الإسلامي مختلفة عن طرق تقييم المخاطرة للمشاريع الاستثمارية الأخرى؟

☐ **نعم** ☐ **لا**

إذا كانت الإجابة **نعم**، يرجى تقديم وصف موجز لعملية التقييم، وبيان نقاط الاختلاف: .....

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الجزء السابع: معلومات عامة

27. يرجى تحديد إلى أي مدى تحاول الجهات الخارجية التالية التأثير على عملية أتخاذ القرار الاستثماري في شركتكم (مثلا: طرق التقييم المستخدمة, المراحل المتبعة لأتخاذ القرار الاستثماري):

الجهات الخارجية	أبداً	نادراً	غالباً	في الغالب	دائماً
موفري الأموال (مثل المصارف)	☐	☐	☐	☐	☐
المحاسبين و المراجعين القانونيين	☐	☐	☐	☐	☐
التعليم المحاسبي والمالي	☐	☐	☐	☐	☐
جهات أخرى, يرجى ذكرها:	☐	☐	☐	☐	☐

.....

28. هل هناك أي اقتراحات أو تعليقات ترغب في إضافتها حول قضايا متعلقة بعملية تقييم الاستثمارات والتي لم يتم التطرق لها في هذا الاستبيان؟

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شكراً جزيلاً على المشاركة بالرد على الاستبيان.

ملاحظة

إذا كنت ترغب في الحصول على نسخة من ملخص نتائج هذا الاستبيان، يرجى تقديم البيانات التالية:

الاسم :.....

العنوان :.....

.....

صندوق البريد:.....

الهاتف :.....

البريد الإلكتروني :.....

ملاحظات توضيحية

المقصود بالمشاريع الاستثمارية: الاستثمار في مشاريع رأسمالية مثل إنشاء مصنع جديد أو إضافة خط إنتاجي جديد أو إنشاء شركة جديدة أو مشروع جديد بالكامل أو تطويرات أساسية كأستبدال أصول قديمة بأخرى حديثة.

السؤال رقم 9

ب) فترة الاسترداد المخصومة (DPB): هي فترة الاسترداد التي تأخذ في الاعتبار مفهوم القيمة الزمنية للنقود وهي محسوبة علي أساس التدفقات النقدية الخارجة و الداخلة المخصومة بتكلفة رأس المال أو سعر الخصم أو معدل العائد المطلوب.

هـ) معدل العائد الداخلي المعدل(MIRR): هو معدل العائد الداخلي الذي يفترض أن التدفقات النقدية الداخلة يعاد استثمارها في المشروع بمعدل المتوسط المرجح لتكلفة رأس المال بدلا من نفس معدل العائد الداخلي للمشروع نفسه.

ألسؤال رقم 10

الأولويات السياسية للدولة: قرارات المؤتمرات الشعبية و المحددة لاستراتيجيات العامة للدولة والمجتمع مثل التحول للإنتاج و توفير الأمن الغذائي و المائي للدولة و المجتمع.

خطط التنمية في الدولة: من حيث دعم و تشجيع قطاعات معينة مثل الصناعات الغذائية أو صناعة مواد البناء أو تشجيع الخدمات السياحية.

دواعي المنافسة: مثل اضطرار الشركة لإنتاج منتج لمجرد توفير كل احتياجات السوق المحلية و استبعاد المنافسة من المنتجات الخارجية.

السؤال رقم 12

نموذج نمو ربح السهم (Dividend Growth Model): نموذج تقيم السهم الذي يتعامل مع الأرباح ونموها، مخصومة إلى القيمة الحالية. هذا النموذج يفترض أن أساس تقييم الأسهم: الربح الحالي, معدل نمو الربح و معدل العائد المطلوب.

معدل العائد الخالي من المخاطرة: مثل معدل الفائدة علي الودائع لدي مصرف ليبيا المركزي.

تكلفة الدين (سعر الفائدة علي القروض): مثل معدل الفائدة علي القرض المستخدم في تمويل المشروع.

السؤال رقم 14

أ).تحليل السيناريو (Scenario Analysis): عملية تقدير القيمة الاقتصادية المتوقعة للمشروع الاستثماري بعد فترة معينة من الزمن ، على افتراض تغييرات معينة في قيم المدخلات و المخرجات(مثل التكاليف و الإيرادات) ، أو العوامل الرئيسية التي من شأنها أن تؤثر على قيم المشروع ، مثل التغيرات في أسعار صرف العملات الأجنبية.

ج) المحاكاة (Simulation e.g. Monte Carlo).: تقنية حل المشكل تستخدم لتقريب احتمال نتائج معينة لتقييم مشروع استثماري عن طريق استخدام متغيرات عشوائية متعددة.

هـ) تحليل بيتا (Beta Analysis) : بيتا ترمز للمخاطرة أو عدم استقرار (خطر منهجي) ، بالمقارنة مع السوق ككل, و المخاطرة متعددة الأنواع وهذا التحليل يقوم بدراسة أنواع المخاطرة المختلفة المرتبطة بمشروع استثماري معين.

السؤال رقم 27

التعليم المحاسبي و المالي: دور مناهج التعليم المحاسبي و المالي الذي تلقاه الموظفين أو متخذي القرار في الشركة.

لأي توضيحات إضافية يرجى الاتصال بـ مفتاح محمد عامر محمد علي رقم الهاتف النقال: 0917015520

Appendix C, Table 1: Tests of Normality

Questions Number	Variables	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Q8b	Multiple-Potential Source of Funding	0.270	42	**0.000**	0.837	42	**0.000**
Q9a	a.Payback (PB)	0.284	44	**0.000**	0.680	44	**0.000**
Q9b	b.Discounted PB	0.317	24	**0.000**	0.836	24	**0.000**
Q9c	c.Net Present Value (NPV)	0.226	36	**0.000**	0.817	36	**0.000**
Q9d	d.Internal Rate of Return (IRR)	0.291	33	**0.000**	0.735	33	**0.000**
Q9e	e.Modified IRR	0.332	27	**0.000**	0.764	27	**0.000**
Q9f	f.Accounting Rate of Return (ARR)	0.288	31	**0.000**	0.854	31	**0.001**
Q9g	g.Profitability Index (PI)	0.298	25	**0.000**	0.771	25	**0.000**
Q10a	Non-FCriteria: a.Political Priorities	0.422	42	**0.000**	0.603	42	**0.000**
Q10b	Non-FCriteria: b.State Development Plans	0.388	42	**0.000**	0.624	42	**0.000**
Q10c	Non-FCriteria: c.Competitor Behaviour	0.227	33	**0.000**	0.881	33	**0.002**
Q10d	Non-FCriteria: d.Personal Experience	0.244	39	**0.000**	0.816	39	**0.000**
Q10e	Non-FCrireria: e.Social&Environmental Factors	0.257	37	**0.000**	0.832	37	**0.000**
Q11a	Project Feature: a.Size	0.266	45	**0.000**	0.790	45	**0.000**
Q11b	Project Feature: b.Nature	0.294	41	**0.000**	0.786	41	**0.000**
Q11c	Project Feature: c.Source of Funding	0.453	44	**0.000**	0.575	44	**0.000**
Q12a	Cost of Capital?	0.339	44	**0.000**	0.637	44	**0.000**
Q13a	Different Discount Rates?	0.531	43	**0.000**	0.331	43	**0.000**
Q13b	Reasons (Why Different Discount Rates?)	0.201	22	**0.022**	0.916	22	**0.063**
Q14a	Risk Assessment?	0.499	45	**0.000**	0.465	45	**0.000**
Q14b1	1.Scenario Analysis	0.357	24	**0.000**	0.787	24	**0.000**
Q14b2	2.Sensitivity Analysis	0.243	22	**0.002**	0.798	22	**0.000**
Q14b3	3.Simulation (e.g. Monte Carlo)	0.213	16	**0.050**	0.893	16	**0.063**
Q14b4	4.Break-even Analysis	0.330	16	**0.000**	0.778	16	**0.001**
Q14b5	5.Beta Analysis	0.290	13	**0.007**	0.848	13	**0.027**
Q14b6	6.Decision Tree	0.386	13	**0.000**	0.746	13	**0.002**
Q14b7	7.Raising the Required Rate of Return	0.311	19	**0.000**	0.789	19	**0.001**
Q14b8	8.Shorten the Payback Period	0.317	24	**0.000**	0.777	24	**0.000**
Q14b9	9.Subjective Assessment	0.311	30	**0.000**	0.841	30	**0.000**
Q15a	a.Determination of the Budget (Stages)	0.360	41	**0.000**	0.713	41	**0.000**
Q15b	b.Search&Development (Stages)	0.234	34	**0.000**	0.841	34	**0.000**
Q15c	c.Evaluation (Stages)	0.322	45	**0.000**	0.745	45	**0.000**
Q15d	d.Authorisation (Stages)	0.328	41	**0.000**	0.726	41	**0.000**
Q15e	e.Monitoring&Control (Stages)	0.355	38	**0.000**	0.695	38	**0.000**
Q17a	Ex-post Audits Period	0.296	43	**0.000**	0.730	43	**0.000**
Q17b	Ex-post Audits Method	0.353	43	**0.000**	0.710	43	**0.000**
Q18	Capital Rationing?	0.213	45	**0.000**	0.912	45	**0.002**
Q19a	Capital Rationing Type	0.360	39	**0.000**	0.725	39	**0.000**
Q19b	Capital Rational Reason	0.319	21	**0.000**	0.823	21	**0.000**
Q20a	Libyan Stock Market Role in ease Capital Rationing	0.507	44	**0.000**	0.440	44	**0.000**
Q20b	If no, the Reason	0.473	5	**0.001**	0.552	5	**0.000**
Q21a	Considering Libyan Stock Market as a source of funding	0.329	45	**0.000**	0.722	45	**0.000**
Q21b	Type of potential financial products	0.208	23	**0.011**	0.831	23	**0.001**
Q22a	Usage of Islamic Finance	0.537	44	**0.000**	0.276	44	**0.000**
Q22b	Islamic Financial Products used	0.385	3	-	0.750	3	**0.000**
Q23a	Considering Islamic Finance?	0.419	43	**0.000**	0.634	43	**0.000**
Q23b	Multiple-Reason of Prefering Islamic Finance	0.305	29	**0.000**	0.772	29	**0.000**
Q23c	Reason of No Preference of Islamic Finance	0.385	3	-	0.750	3	**0.000**
Q24	Project features which may influencing usage of IF	0.254	6	**0.200**	0.866	6	**0.212**
Q27a	Out-sider group: a.Fund provider	0.155	42	**0.120**	0.902	42	**0.002**
Q27b	Out-sider group: b.Accountant Practitioners	0.229	42	**0.000**	0.824	42	**0.000**
Q27c	Out-sider group: c.Accounting&Financial Education	0.210	41	**0.000**	0.879	41	**0.000**
Q27d	Out-sider group: d.Economic&Financial Policy of the State	0.300	10	**0.011**	0.841	10	**0.045**

Appendix C, Table 2: Importance of each of Financial Criteria is in investment appraising process in these firms.

Appraisal Techniques				Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
				SF		MF		OG		FI		FF			Small		Medium		Large		
	N (%)	Mean (P-Value)	Mean Rank	N (%)	Mean (P-Value)	N (%)	Mean (P-Value)	N (%)	Mean (P-Value)	N (%)	Mean (P-Value)	N (%)	Mean (P-Value)	(P-Value)	N (%)	Mean (P-Value)	N (%)	Mean (P-Value)	N (%)	Mean (P-Value)	(P-Value)
PB	44 (98%)	**4.364** (0.00)	**1**	9 (100%)	**4.111** (0.01)	15 (100%)	**4.467** (0.00)	9 (90%)	**4.111** (0.01)	6 (100%)	**4.833** (0.00)	5 (100%)	**4.400** (0.01)	(0.26)	13 (100%)	**4.538** (0.00)	20 (100%)	**4.300** (0.00)	11 (92%)	**4.273** (0.00)	(0.83)
PI	25 (56%)	**4.320** (0.00)	**2**	7 (78%)	**4.857** (0.00)	10 (67%)	**4.200** (0.00)	5 (50%)	**4.200** (0.03)	0 (00%)	**0.000** (0.00)	3 (60%)	**3.667** (0.18)	(0.08)	6 (0.46)	**4.500** (0.00)	11 (0.55)	**4.273** (0.00)	8 (0.67)	**4.250** (0.00)	(0.84)
IRR	33 (73%)	**4.303** (0.00)	**3**	7 (78%)	**4.571** (0.00)	13 (87%)	**4.077** (0.01)	7 (70%)	**4.429** (0.00)	1 (17%)	**4.000** …….	5 (100%)	**4.400** (0.03)	(0.90)	9 (0.69)	**4.556** (0.00)	15 (0.75)	**4.133** (0.00)	9 (0.75)	**4.333** (0.00)	(0.78)
NPV	36 (80%)	**4.056** (0.00)	**4**	9 (100%)	**4.000** (0.00)	13 (87%)	**3.923** (0.01)	8 (80%)	**4.625** (0.00)	2 (33%)	**3.000** ……	4 (80%)	**4.000** (0.18)	(0.13)	9 (0.69)	**4.111** (0.01)	17 (0.85)	**3.824** (0.01)	10 (0.83)	**4.400** (0.00)	(0.37)
MIRR	27 (60%)	**3.963** (0.00)	**5**	9 (100%)	**4.000** (0.00)	8 (53%)	**3.750** (0.11)	6 (60%)	**4.000** (0.01)	1 (17%)	**5.000** ……	3 (60%)	**4.000** (0.23)	(0.67)	7 (0.54)	**4.571** (0.00)	11 (0.55)	**3.550** (0.11)	9 (0.75)	**4.000** (0.00)	**(0.03)**
ARR	31 (69%)	**3.839** (0.00)	**6**	9 (100%)	**3.222** (0.45)	10 (67%)	**4.200** (0.00)	7 (70%)	**4.000** (0.02)	3 (50%)	**4.333** (0.06)	2 (40%)	**4.444** (0.50)	(0.08)	9 (0.69)	**3.778** (0.02)	12 (0.60)	**3.583** (0.03)	10 (0.83)	**4.200** (0.00)	(0.21)
DPB	24 (53%)	**3.583** (0.00)	**7**	8 (89%)	**3.125** (0.73)	7 (47%)	**3.571** (0.10)	6 (60%)	**4.167** (0.00)	0 (00%)	**0.000** (0.00)	3 (60%)	**3.667** (0.18)	(0.11)	6 (0.46)	**3.667** (0.10)	10 (0.50)	**3.200** (0.51)	8 (0.67)	**4.000** (0.00)	(0.16)
Other	2 (04%)	**5.000** …….	**8**	1 (11%)	**5.000** …..	1 (07%)	**5.000** …..	0 (00%)	**0.000** (0.00)	0 (00%)	**0.000** (0.00)	0 (00%)	**0.000** (0.00)	(1.00)	2 (0.15)	**5.000** …….	0 (0.00)	**0.000** (0.00)	0 (0.00)	**0.000** (0.00)	(1.00)
Non-DCF	**102** (57%)	**4.206** (0.00)		**26**	**4.038** (0.00)	**36**	**4.000** (0.00)	**21**	**4.095** (0.00)	**9**	**4.666** (0.00)	**10**	**3.808** (0.00)		**30**	**4.333** (0.00)	**43**	**4.093** (0.00)	**29**	**4.241** (0.00)	
DCF	**120** (67%)	**4.008** (0.00)		**33**	**3.909** (0.00)	**41**	**3.878** (0.00)	**27**	**4.334** (0.00)	**4**	**3.750** (0.22)	**15**	**4.067** (0.00)		**31**	**4.258** (0.00)	**53**	**3.737** (0.00)	**36**	**4.194** (0.00)	
All Mean		**4.099** (0.00)		**9** (21%)	**3.966** (0.00)	**15** (33%)	**3.938** (0.00)	**10** (22%)	**4.229** (0.00)	**6** (13%)	**4.384** (0.00)	**5** (11%)	**4.116** (0.00)		**13** (0.29)	**4.295** (0.00)	**20** (0.44)	**3.896** (0.00)	**12** (0.27)	**4.215** (0.00)	

Note: SF: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **%**: Percentage within the group; **N**= Number of Response; **IRR**: Internal Rate of Return; **NPV**: Net Present Value; **MIRR**: Modified Internal Rate of Return; **DCF**: Techniques use Discounted Cash Flow; ; **Non-DCF**: Techniques does not use Discounted Cash Flow; **PB**: PayBack; **PI**: Profitability Index; **ARR**: Accounting Rate of Return; **ROI**: Return On Investment; **PB**: Payback; **PI**: Profitability Index; **IRR**: Internal Rate of Return; **NPV**: Net Present Value; **MIRR**: Modified IRR; **DPB**: Discounted PB; **Others**: 1 Break-even Analysis, 1 SWOT analysis**; t-test P**<0.05 Indicates the mean is significantly different from the neutral position (3); **Kruskal-Wallis's test P**-Value <0.05 : there is significant different between the groups.

Mann-Whitney test

Size Groups of MIRR	E1-E2	E1-E3	E2-E3	Mean Rank			
				E2	7.27	E3	6.72
P-Value	0.02	0.05	0.26	E1	13.00	E1	10.79

Note: Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different. Firm's Size Groups: E1: Small ; E2: Medium; E3: Large.

Appendix C, Table 3: Importance of each of these Non-Financial Factors in investment appraising process of these firms.

Non-Financial Criteria				Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
				SF		MF		OG		FI		FF			Small		Medium		Large		
	Number	Mean	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean		N	Mean	N	Mean	N	Mean	
	(%)	(P-Value)	Rank	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	P-Value	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	P-Value
PP	42	**4.620**	**1**	9	**4.444**	13	**4.846**	10	**4.400**	6	**5.000**	4	**4.250**	(0.18)	11	**4.636**	19	**4.632**	12	**4.583**	(0.96)
	(93%)	(0.00)		(100%)	(0.00)	(87%)	(0.00)	(100%)	(0.00)	(1.00)	…..	(80%)	(0.08)		(85%)	(0.00)	(95%)	(0.00)	(100%)	(0.00)	
SDP	42	**4.600**	**2**	9	**4.556**	14	**4.643**	10	**4.600**	4	**4.750**	5	**4.400**	(0.85)	11	**4.364**	19	**4.632**	12	**4.750**	(0.16)
	(93%)	(0.00)		(100%)	(0.00)	(93%)	(0.00)	(100%)	(0.00)	(67%)	(0.01)	(100%)	(0.01)		(85%)	(0.00)	(95%)	(0.00)	(100%)	(0.00)	
PEx	39	**4.150**	**3**	9	**4.222**	12	**4.000**	9	**3.889**	6	**4.833**	3	**4.000**	(0.25)	11	**4.455**	17	**4.235**	11	**3.727**	(0.19)
	(87%)	(0.00)		(100%)	(0.00)	(80%)	(0.01)	(90%)	(0.02)	(100%)	(0.00)	(60%)	(0.23)		(85%)	(0.00)	(85%)	(0.00)	(92%)	(0.05)	
SEF	37	**4.000**	**4**	**9**	**4.444**	10	**3.900**	9	**3.333**	4	**5.000**	5	**3.800**	**(0.02)**	9	**3.889**	17	**4.294**	11	**3.636**	(0.23)
	(82%)	(0.00)		(100%)	(0.00)	(67%)	(0.04)	(90%)	(0.35)	(67%)	……	(100%)	(0.10)		(69%)	(0.00)	(85%)	(0.00)	(92%)	(0.07)	
CB	33	**3.760**	**5**	9	**4.222**	11	**4.000**	8	**3.889**	2	**4.833**	3	**4.000**	(0.15)	9	**4.455**	14	**4.235**	10	**3.727**	(0.55)
	(73%)	(0.00)		(100%)	(0.00)	(73%)	(0.03)	(80%)	(1.00)	(33%)	(0.50)	(60%)	(0.23)		(69%)	(0.01)	(70%)	(0.06)	(83%)	(0.11)	
LR	1	**5.000**	**……**	0	**0.000**	1	**5.000**	0	**0.000**	0	**0.000**	0	**0.000**		1	**5.000**	0	**0.000**	0	**0.000**	
	(02%)	……...		(00%)	(0.00)	(07%)	……	(00%)	(0.00)	(00%)	(0.00)	(00%)	(0.00)		(08%)	…….	(00%)	(0.00)	(00%)	(0.00)	
All Mean		**4.259**		9	**4.377**	15	**4.311**	10	**4.043**	6	**4.884**	**5**	**4.100**		13	**4.389**	20	**4.416**	12	**4.105**	
		(0.00)		(20%)	(0.00)	(33%)	(0.00)	(22%)	(0.00)	(13%)	(0.00)	0.11111	(0.00)		(29%)	(0.00)	(44%)	(0.00)	(27%)	(0.00)	

Note: SF: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **PP**: Political Priorities; **SDP**: State Development Plan; **PEx**: Personal Experience; **SEF**: Social & Environmental Factors; **CB**:Competitor Behaviour; **LR**: Laws & Reulations; **%**: Percentage within the group; **N**= Number of Response; **t-teset P-Value** < 0.05 indicates the mean is significantly different from the neutral position (3); **Kruskal-Wallis's P-Value** <0.05 : there is significant different between the groups.

Mann-Whitney test

Non-FCrireria: Social & Environmental Factors	S1-S2	S1-S3	S1-S4	S1-S5	S2-S3	S2-S4	S2-S5	S3-S4	S3-S5	S4-S5
P-Value	0.30	**0.02**	0.07	0.13	0.16	**0.03**	0.56	**0.01**	0.40	**0.03**

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different.

Mann-Whitney Mean Rank

S3	6.61	**S2**	6.10	**S3**	5.22	**S5**	3.40
S1	12.39	**S4**	11.000	**S4**	11.000	**S4**	7.00

S1: Services Firms; S2: Manufacturing; S3: Oil&Gas; S4: Food Industries; S5: Financial Firms.

Appendix C, Table 4: Important of each of these Project Features is in determining of type or combination of techniques used in investment appraising process in these firms.

Project Features				Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
				SF		MF		OG		FI		FF			Small		Medium		Large		
	Number	Mean	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean		N	Mean	N	Mean	N	Mean	
	%	(P-Value)	Rank	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(P-Value)
Source of Funding	44	**4.700**	**1**	9	**4.778**	14	**4.643**	10	**4.700**	6	**5.000**	5	**4.400**	(0.48)	12	**4.667**	20	**4.800**	12	**4.583**	(0.43)
	(98%)	(0.00)		(100%)	(0.00)	(93%)	(0.00)	(100%)	(0.00)	(100%)	…..	(100%)	(0.03)		(52%)	(0.00)	(100%)	(0.00)	(100%)	(0.00)	
Size	45	**4.200**	**2**	9	**4.222**	15	**4.200**	10	**4.400**	6	**3.833**	5	**4.200**	(0.59)	13	**4.000**	20	**4.200**	12	**4.417**	(0.47)
	(100%)	(0.00)		(100%)	(0.01)	(100%)	(0.00)	(100%)	(0.00)	(100%)	(0.04)	(100%)	(0.00)		(57%)	(0.00)	(100%)	(0.00)	(100%)	(0.00)	
Nature	41	**4.150**	**3**	9	**4.556**	12	**4.167**	10	**4.000**	5	**3.600**	5	**4.200**	(0.11)	12	**3.917**	17	**4.235**	12	**4.250**	(0.57)
	(91%)	(0.00)		(100%)	(0.00)	(80%)	(0.00)	(100%)	(0.00)	(83%)	(0.21)	(100%)	(0.00)		(52%)	(0.01)	(85%)	(0.00)	(100%)	(0.00)	
Timing	1	**5.000**	**4**	0	**…….**	0	**……**	1	**5.000**	0	**…….**	0	**…….**	**…..**	0	**…….**	1	**5.000**	0	**…….**	**…..**
	(02%)	…..		(00%)	…….	(00%)	……...	(10%)	……	(00%)	……	(00%)	…….		(00%)	…..	(05%)	……	(00%)	…….	
Grand Mean		**4.358**		9	**4.519**	15	**4.342**	10	**4.387**	6	**4.176**	5	**4.267**		13	**4.189**	20	**4.431**	12	**4.417**	
		(0.00)		(20%)	(0.00)	(33%)	(0.00)	(22%)	(0.00)	(13%)	(0.00)	(11%)	(0.00)		(29%)	(0.00)	(44%)	(0.00)	(27%)	(0.00)	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **N**= Number of Response; **%**: Percentage within the group**; t-teset P-Value** < 0.05 indicates the mean is significantly different from the neutral position (3); **Kruskal-Wallis's test P-Value** <0.05 : there is significant different between the groups.

Appendix C, Table 5: Firms assess the risk. (Part 1)

Risk Assessment?	Whole Sample		Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
			SF		MF		OG		FI		FF			Small		Medium		Large		
	N	%	N	%	N	%	N	%	N	%	N	%	P-Value	N	%	N	%	N	%	P-Value
Yes	37	82%	8	89%	6	43%	2	20%	2	33%	4	80%	0.6	12	92%	17	85%	8	67%	0.231
No	8	18%	1	11%	8	57%	8	80%	4	67%	1	20%		1	8%	3	15%	4	33%	
Total	45	100%	9	100%	14	100%	10	100%	6	100%	5	100%		13	100%	20	100%	12	100%	

The importance of these Risk Assessment methods in risk evaluation process in firms.

Assessment Methods				Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
				SF		MF		OG		FI		FF			Small		Medium		Large		
	N	Mean	Mean's	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean		N	Mean	N	Mean	N	Mean	
	%	(P-Value)	Rank	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(P-Value)
BEA	16	**4.120**	1	2	**4.500**	4	**4.500**	7	**4.000**	0	**0.000**	3	**3.667**	(0.25)	4	**4.000**	6	**4.333**	6	**4.000**	(0.60)
	(36%)	(0.00)		(22%)	(0.21)	(27%)	(0.01)	(70%)	(0.00)	(00%)	(0.00)	(60%)	(0.50)		(31%)	(0.09)	(30%)	(0.00)	(50%)	(0.01)	
SPB	24	**4.040**	2	6	**4.333**	**7**	**3.857**	7	**4.143**	**1**	**4.000**	3	**3.667**	(0.76)	**5**	**4.000**	12	**3.917**	7	**4.286**	(0.44)
	(53%)	(0.00)		(67%)	(0.00)	(47%)	(0.17)	(70%)	(0.03)	(17%)	.....	(60%)	(0.18)		(38%)	.....	(60%)	(0.02)	(58%)	(0.02)	
RRR	19	**3.950**	3	5	**4.200**	4	**3.250**	6	**4.167**	0	**0.000**	4	**4.000**	(0.67)	3	**3.333**	10	**4.000**	6	**4.167**	(0.21)
	(42%)	(0.00)		(56%)	(0.07)	(27%)	(0.76)	(60%)	(0.00)	(00%)	(0.00)	(80%)	(0.09)		(23%)	(0.42)	(50%)	(0.03)	(50%)	(0.00)	
SEN	22	**3.950**	4	5	**4.800**	7	**3.714**	6	**3.500**	0	**0.000**	4	**4.000**	(0.20)	5	**4.800**	11	**4.273**	6	**2.667**	**(0.01)**
	(49%)	(0.00)		(56%)	(0.00)	(47%)	(0.18)	(60%)	(0.36)	(00%)	(0.00)	(80%)	(0.18)		(38%)	(0.00)	(55%)	(0.00)	(50%)	(0.47)	
SCE	24	**3.830**	5	4	**4.500**	7	**3.143**	8	**4.000**	1	**4.000**	4	**4.000**	(0.40)	5	**4.200**	11	**4.000**	8	**3.375**	(0.16)
	(53%)	(0.00)		(44%)	(0.01)	(47%)	(0.81)	(80%)	(0.00)	(17%)	.....	(80%)	(0.09)		(38%)	(0.00)	(55%)	(0.02)	(67%)	(0.29)	
SUB	30	**3.730**	6	4	**2.750**	**11**	**4.273**	7	**3.000**	**4**	**4.250**	4	**4.000**	**(0.01)**	**9**	**3.889**	14	**3.857**	7	**3.286**	(0.29)
	(67%)	(0.00)		(44%)	(0.72)	(73%)	(0.00)	(70%)	(1.00)	(67%)	(0.02)	(80%)	.....		(69%)	(0.05)	(70%)	(0.00)	(58%)	(0.46)	
SIM	16	**3.120**	7	3	**3.667**	4	**2.000**	7	**3.571**	0	**0.000**	2	**3.000**	(0.37)	3	**3.667**	7	**3.429**	6	**2.500**	(0.43)
	(36%)	(0.72)		(33%)	(0.42)	(27%)	(0.39)	(70%)	(0.17)	(00%)	(0.00)	(40%)	.....		(23%)	(0.42)	(35%)	(0.45)	(50%)	(0.42)	
DTA	13	**3.080**	8	2	**4.000**	3	**2.667**	6	**3.000**	0	**0.000**	2	**3.000**	(0.43)	3	**3.667**	4	**3.000**	6	**2.833**	(0.41)
	(29%)	(0.72)		(22%)	(0.50)	(20%)	(0.42)	(60%)	(1.00)	(00%)	(0.00)	(40%)	.....		(23%)	(0.42)	(20%)	.....	(50%)	(0.61)	
BET	13	**2.620**	9	2	**4.000**	3	**1.667**	6	**2.667**	0	**0.000**	2	**2.500**	(0.19)	2	**4.000**	5	**2.400**	6	**2.333**	(0.22)
	(29%)	(0.21)		(22%)	(0.50)	(20%)	(0.18)	(60%)	(0.17)	(00%)	(0.00)	(40%)	.....		(15%)	(0.50)	(25%)	(0.21)	(50%)	(0.10)	
Other	1	**5.000**	.....	0	**0.000**	**0**	**0.000**	0	**0.000**	**0**	**0.000**	1	**5.000**	.....	**0**	**0.000**	1	**5.000**	0	**0.000**	.....
	(02%)	.....		(00%)	(0.00)	(00%)	(0.00)	(00%)	(0.00)	(00%)	(0.00)	(20%)	.....		(00%)	(0.00)	(05%)	.....	(00%)	(0.00)	
Total Mean		**3.695**		9	**4.121**	**15**	**3.480**	10	**3.583**	**6**	**4.167**	5	**3.724**		**13**	**4.000**	20	**3.840**	12	**3.293**	
		(0.00)		(20%)	(0.00)	(33%)	(0.00)	(22%)	(0.00)	(13%)	(0.00)	(11%)	(0.00)		(29%)	(0.00)	(44%)	(0.00)	(27%)	(0.00)	

Note: SF: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **%**: Percentage; **N**= Number of Response; **Others**: SWOT analysis; BEA: Break-even Analysis**; SPB**: Shorten the PB period; **RRR**: Raising Req. Rate of Return; **SEN**: Sensitivity Analysis; **SCE**: Scenario Analysis; **SUB**: Subjective Assessment; **SIM**: Simulation (Monte Carlo); **DTA**: Decision Tree; **BET**: Beta Analysis; **Kruskal-Wallis's test P-Value** <0.05 : there is significant different between the groups; **t-teset P-Value** < 0.05 indicates the mean is significantly different from the neutral position (3).

Appendix C, Table 5: Firms assess the risk. (Part 2)

Mann-Whitney test

Subjective Assessment	S1-S2	S1-S3	S1-S4	S1-S5	S2-S3	S2-S4	S2-S5	S3-S4	S3-S5	S4-S5
P-Value	**0.018**	0.841	**0.044**	**0.046**	**0.005**	0.880	0.345	**0.027**	**0.037**	0.317

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different.

Mann-Whitney Mean Rank

S1	3.75	**S1**	2.880	**S1**	3.000	**S3**	5.36	**S3**	4.43	**S3**	4.57
S2	9.55	**S4**	6.12	**S5**	6.00	**S2**	12.14	**S4**	8.75	**S5**	8.50

S1: Services Firms; S2: Manufacturing; S3: Oil&Gas; S4: Food Industries; S5: Financial Firms.

Mann-Whitney test				Mean Rank			
Sensitivity	E1-E2	E1-E3	E2-E3	E3	3.67	E3	4.83
P-Value	0.18	**0.01**	**0.01**	E1	8.80	E2	11.27

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different; E1: Small ; E2: Medium; E3: Large.

Appendix C, Table 6: Cost of capital (Part 1)

Cost of Capital	Whole Sample		Sectors										Kruskal-Wallis's test P-Value	Firm's Size Groups						Kruskal-Wallis's test P-Value
			SF		MF		OG		FI		FF			Small		Medium		Large		
Panel A: Firms calculate thier cost of capital.																				
Yes	**22**	**50%**	3	33%	8	53%	6	60%	3	50%	2	40%	**(0.02)**	4	31%	12	60%	6	55%	(0.48)
No	**22**	**50%**	6	67%	7	47%	4	40%	3	50%	3	60%		9	69%	8	40%	5	45%	
Total	**44**	**100%**	**9**	**100%**	**15**	**100%**	**10**	**100%**	**6**	**100%**	**5**	**100%**		**13**	**100%**	**20**	**100%**	**11**	**100%**	
Panel B: The Method(s) used to calculate the Cost of Capital (Discount rate).																				
1.Capital Asset Pricing Model (CAPM) / Weighted Average Cost of Capital (WACC).	**4**	**18%**	1	33%	0	0%	1	17%	0	0%	2	100%		0	0%	4	34%	0	0%	
2.Subjective Judgment.	**6**	**27%**	1	33%	2	25%	2	33%	1	33%	0	0%		1	25%	3	25%	2	33%	
3. Dividend Growth Model.	**0**	**0%**	0	0%	0	0%	0	0%	0	0%	0	0%		0	0%	0	0%	0	0%	
4.Risk-free Rate / Cost of debt (Interest rate).	**4**	**18%**	0	0%	0	0%	2	33%	2	67%	0	0%	(0.71)	0	0%	1	8%	3	50%	(0.66)
5.Set by the Owner.	**1**	**5%**	0	0%	1	12%	0	0%	0	0%	0	0%		0	0%	1	8%	0	0%	
Two Methods {1:(1,2); 1:(1,3); 2:(1,4)}.	**4**	**18%**	1	33%	3	38%	0	0%	0	0%	0	0%		1	25%	3	25%	0	0%	
Three Methods {2:(1,3,4); 1=(2,3,4)}.	**3**	**14%**	0	0%	2	25%	1	17%	0	0%	0	0%		2	50%	0	0%	1	17%	
Total	**22**	**100%**	**3**	**100%**	**8**	**100%**	**6**	**100%**	**3**	**100%**	**2**	**100%**		**4**	**100%**	**12**	**100%**	**6**	**100%**	
Panel C: The Method(s) Separately.																				
1.Capital Asset Pricing Model (CAPM) / Weighted Average Cost of Capital (WACC).	**10**	**45%**	2	67%	4	50%	2	33%	0	0%	2	100%		3	75%	7	58%	0	0%	
2.Subjective Judgment.	**8**	**36%**	1	33%	4	50%	2	33%	1	33%	0	0%		2	50%	3	25%	3	50%	
3. Dividend Growth Model.	**4**	**18%**	1	33%	2	25%	1	17%	0	0%	0	0%		2	50%	1	8%	1	17%	
4.Risk-free Rate / Cost of debt (Interest rate).	**9**	**41%**	0	0%	4	50%	3	50%	2	67%	0	0%		2	50%	3	25%	4	67%	
5.Set by the Owner.	**1**	**5%**	0	0%	1	13%	0	0%	0	0%	0	0%		0	0%	1	8%	0	0%	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **Kruskal-Wallis's P-Value** <0.05 : there is significant different between the groups.

Appendix C, Table 6: Cost of capital (Part 2)

Mann-Whitney test

Cost of Capital	S1-S2	S1-S3	S1-S4	S1-S5	S2-S3	S2-S4	S2-S5	S3-S4	S3-S5	S4-S5
P-Value	0.031	**0.003**	**0.031**	0.661	0.252	0.698	0.165	0.564	**0.031**	0.140

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different.

Mann-Whitney Mean Rank

S1	6.56	**S*1***	6.33	**S5**	5.00
S3	13.10	**S4**	10.50	**S3**	9.50

S1: Services Firms; S2: Manufacturing; S3: Oil&Gas; S4: Food Industries; S5: Financial Firms.

Appendix C, Table 7: Different discount rates

Cost of Capital?	Whole Sample		Sectors										Kruskal-Wallis's test P-Value	Firm's Size Groups						Kruskal-Wallis's test P-Value
			SF		MF		OG		FI		FF			Small		Medium		Large		
Panel A: Firm use different discount rates for different inverstment projects.																				
Yes	**4**	**9%**	1	13%	2	13%	0	0%	0	0%	1	25%	(0.54)	1	8%	2	11%	1	8%	(0.94)
No	**39**	**91%**	7	88%	13	87%	10	100%	6	100%	3	75%		12	92%	16	89%	11	92%	
Total	**43**	**100%**	**8**	**100%**	**15**	**100%**	**10**	**100%**	**6**	**100%**	**4**	**100%**		**13**	**100%**	**18**	**100%**	**12**	**100%**	
Panel B: The reason(s) Why these firm use different discount rates.																				
Consistent with conditions of the projects.	**1**	**33%**	0	0%	0	0%	0	0%	0	0%	1	100%		0	0%	1	50%	0	0%	
Consistent with concept of time value of money.	**1**	**33%**	0	0%	1	100%	0	0%	0	0%	0	0%		1	100%	0	0%	0	0%	
Consistent with the change in discount rates (interest).	**1**	**33%**	1	100%	0	0%	0	0%	0	0%	0	0%		0	0%	1	50%	0	0%	
Total	**3**	**100%**	**1**	100%	**1**	100%	**0**	0%	**0**	**0%**	**1**	**100%**		**1**	**100%**	**2**	**100%**	**0**	**0%**	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **Kruskal-Wallis's P-Value** <0.05 : there is significant different between the groups.

Appendix C, Table 8: Importance of each of these Stages is in investment decision-making process in these firms.

Stages				Sectors										Kruskal-Wallis's test	Firm's Size Groups					Kruskal-Wallis's test
				SF		MF		OG		FI		FF			Small		Medium		Large	
	N	Mean	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean		N	Mean	N	Mean	N	Mean	
	(%)	(P-Value)	Rank	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	P-Value	(%)	(P-Value	(%)	(P-Value	(%)	(P-Value)	P-Value
1. Determination of the Bydget	41	**4.460**	**2**	9	**4.444**	14	**4.429**	10	**4.500**	4	**4.250**	4	**4.750**	(0.79)	12	**4.167**	17	**4.706**	12	**4.417**	(0.12)
	(91%)	**(0.00)**		(100%)	(0.00)	(93%)	(0.00)	(100%)	(0.00)	(67%)	(0.02)	(80%)	(0.01)		(92%)	(0.00)	(85%)	(0.00)	(100%)	(0.00)	
2. Search & Development	34	**4.120**	**5**	9	**4.444**	12	**4.083**	9	**3.667**	1	**5.000**	3	**4.333**	(0.30)	10	**4.400**	13	**4.462**	11	**3.455**	**(0.01)**
	(76%)	**(0.00)**		(100%)	(0.00)	(80%)	(0.00)	(90%)	(0.08)	(17%)	…….	(60%)	(0.06)		(77%)	(0.00)	(65%)	(0.00)	(92%)	(0.05)	
3. Evaluation	45	**4.420**	**4**	9	**4.889**	15	**4.400**	10	**4.100**	6	**4.167**	5	**4.600**	(0.08)	13	**4.385**	20	**4.550**	12	**4.250**	(0.48)
	(100%)	**(0.00)**		(100%)	(0.00)	(100%)	(0.00)	(100%)	(0.00)	(100%)	(0.00)	(100%)	(0.00)		(100%)	(0.00)	(100%)	(0.00)	(100%)	(0.00)	
3. Authorisation	41	**4.460**	**2**	8	**4.500**	14	**4.500**	9	**4.333**	5	**4.600**	5	**4.400**	(0.94)	12	**4.750**	17	**4.412**	12	**4.250**	(0.13)
	(91%)	**(0.00)**		(89%)	(0.00)	(93%)	(0.00)	(90%)	(0.00)	(83%)	(0.00)	(100%)	(0.01)		(92%)	(0.00)	(85%)	(0.00)	(100%)	(0.00)	
4. Monitoring & Control	38	**4.530**	**1**	8	**4.500**	14	**4.500**	8	**4.750**	5	**4.200**	3	**4.667**	(0.46)	10	**4.700**	16	**4.375**	12	**4.583**	(0.36)
	(84%)	**(0.00)**		(89%)	(0.00)	(93%)	(0.00)	(80%)	(0.00)	(83%)	(0.00)	(60%)	(0.04)		(77%)	(0.00)	(80%)	(0.00)	(100%)	(0.00)	
Total Mean		**4.406**		9	**4.558**	15	**4.391**	10	**4.261**	6	**4.333**	5	**4.550**		13	**4.474**	20	**4.506**	12	**4.203**	
		(0.00)		(20%)	(0.00)	(33%)	(0.00)	(22%)	(0.00)	(13%)	(0.00)	(11%)	(0.00)		(29%)	(0.00)	(44%)	(0.00)	(27%)	(0.00)	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **%**: Percentage within the group; **N**= Number of Response**; t-test P**<0.05 Indicates the mean is significantly different from the neutral position (3); **Kruskal-Wallis's test P-Value** <0.05 : there is significant different between the groups.

Mann-Whitney test				Mean Rank			
Search&Development	**E1-E2**	**E1-E3**	**E2-E3**	**E3**	8.00	**E3**	8.09
P-Value	1.000	**0.014**	**0.003**	**E1**	14.30	**E2**	16.23

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different; E1: Small ; E2: Medium; E3: Large.

Appendix C, Table 9: Ex-post Audits phase

Panel A: Ex-post Audits Period.																				
Period of Ex-post Audits	Whole Sample		Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
			SF		MF		OG		FI		FF			Small		Medium		Large		
	N	%	N	%	N	%	N	%	N	%	N	%	P-Value	N	%	N	%	N	%	P-Value
Less 12 months	19	44%	3	38%	7	47%	5	56%	4	67%	0	0%	(0.37)	8	67%	6	30%	5	45%	(0.06)
12-24 months	17	40%	3	38%	6	40%	4	44%	0	0%	4	80%		3	25%	8	40%	6	55%	
25-36 months	3	7%	1	13%	1	7%	0	0%	1	17%	0	0%		1	8%	2	10%	0	0%	
37-48 months	1	2%	0	0%	0	0%	0	0%	0	0%	1	20%		0	0%	1	5%	0	0%	
More 48 months	3	7%	1	13%	1	7%	0	0%	1	17%	0	0%		0	0%	3	15%	0	0%	
Total	43	100%	8	100%	15	100%	9	100%	6	100%	5	100%		12	100%	20	100%	11	100%	
Panel B: How this Ex-post Audits phase takes place (Method).																				
Comparing with Feasibility Study	24	56%	6	75%	7	47%	7	78%	0	0%	4	80%	(0.02)	7	58%	12	60%	5	45%	(0.06)
Regular Follow-up	17	40%	2	25%	6	40%	2	22%	6	100%	1	20%		5	42%	8	40%	4	36%	
Budgeting	2	5%	0	0%	2	13%	0	0%	0	0%	0	0%		0	0%	0	0%	2	18%	
Total	43	100%	8	100%	15	100%	9	100%	6	100%	5	100%		12	100%	20	100%	11	100%	

Note: Kruskal-Wallis's P-Value <0.05 : there is significant different between the groups.

Mann-Whitney test

Ex-post Audits Method	S1-S2	S1-S3	S1-S4	S1-S5	S2-S3	S2-S4	S2-S5	S3-S4	S3-S5	S4-S5
P-Value	0.164	0.896	**0.007**	0.841	0.117	0.185	0.185	**0.004**	0.925	**0.009**

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different.

Mann-Whitney Mean Rank

S1	5.25	S3	5.67	S5	3.60
S4	10.50	S4	11.50	S4	8.00

S1: Services Firms; S2: Manufacturing; S3: Oil&Gas; S4: Food Industries; S5: Financial Firms.

Appendix C, Table 10: Capital Rationing

Frequency of Capital Rationing.	Total		Sectors										Kruskal-Wallis's test P-Value	Firm's Size Groups						Kruskal-Wallis's test P-Value
			SF		MF		OG		FI		FF			Small		Medium		Large		
	N	%	N	%	N	%	N	%	N	%	N	%		N	%	N	%	N	%	
Panel A: Frequency of Capital Rationing.																				
With all Investment projects	2	4%	2	22%	0	0%	0	0%	0	0%	0	0%	(0.65)	0	0%	2	11%	0	0%	(0.10)
With most Investment projects	9	20%	1	11%	2	13%	2	20%	3	50%	1	20%		2	16%	6	33%	1	7%	
With some Investment projects	18	40%	1	11%	8	53%	5	50%	2	33%	2	40%		5	38%	5	28%	8	57%	
With a few Investment projects	11	24%	2	22%	4	27%	3	30%	1	17%	1	20%		5	38%	2	11%	4	29%	
Never	5	11%	3	33%	1	7%	0	0%	0	0%	1	20%		1	8%	3	17%	1	7%	
Total	45	100%	9	100%	15	100%	10	100%	6	100%	5	100%		13	100%	18	100%	14	100%	
Panel B: Type of Capital Rationing.																				
Internal	13	33%	2	33%	2	14%	4	44%	2	33%	3	75%	(0.14)	5	50%	5	29%	3	25%	(0.35)
External	24	62%	4	67%	10	71%	5	56%	4	67%	1	25%		5	50%	11	65%	8	67%	
Both	2	5%	0	0%	2	14%	0	0%	0	0%	0	0%		0	0%	1	6%	1	8%	
Total	39	100%	6	100%	14	100%	9	100%	6	100%	4	10%		10	100%	17	100%	12	100%	
Panel C: Reason(s) for Capital Rationing.																				
1.Determination of the money available for investment by the owner	6	28%	1	33%	0	0%	2	40%	0	0%	3	100%	**(0.04)**	0	0%	4	44%	2	33%	(0.13)
2.State actions and/or lending policy and discount rates in the banks	9	43%	2	67%	3	50%	2	40%	2	50%	0	0%		3	50%	4	44%	2	33%	
3.Maintain liquidity of the company	1	5%	0	0%	1	16.6%	0	0%	0	0%	0	0%		1	16.6%	0	0%	0	0%	
4.Debit Control	3	14%	0	0%	0	0%	1	20%	2	50%	0	0%		1	16.6%	1	12%	1	17%	
Two reasons {2,4)	1	5%	0	0%	1	16.6%	0	0%	0	0%	0	0%		0	0%	0	0%	1	17%	
Two reasons {3,4}	1	5%	0	0%	1	16.6%	0	0%	0	0%	0	0%		1	16.6%	0	0%	0	0%	
Total	21	100%	3	100%	6	100%	5	100%	4	100%	3	100%		6	100%	9	100%	6	100%	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **%**: Percentage within the group; **N**= Number of Response; **Kruskal-Wallis's P-Value** <0.05 : there is significant different between the groups.

Mann-Whitney test										
Capital Rationing Reason	S1-S2	S1-S3	S1-S4	S1-S5	S2-S3	S2-S4	S2-S5	S3-S4	S3-S5	S4-S5
P-Value	0.090	0.870	0.115	0.114	0.125	0.819	**0.016**	0.190	0.121	**0.025**

Mann-Whitney Mean Rank			
S5	2.00	S5	2.00
S2	6.50	S4	5.50

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different; S1: Services Firms; S2: Manufacturing; S3: Oil&Gas; S4: Food Industries; S5: Financial Firms.

Appendix C, Table 11: Libyan Stock Market Role

Panel A: Would existence of Libyan Stock Market help to alleviate external restrictions on the funding available for investment?																				
Role of existence of Libyan Stock Market	Total		Sectors										Kruskal-Wallis's test P-Value	Firm's Size Groups						Kruskal-Wallis's test P-Value
			SF		MF		OG		FI		FF			Small		Medium		Large		
	N	%	N	%	N	%	N	%	N	%	N	%		N	%	N	%	N	%	
Yes	37	84%	9	100%	14	93%	6	60%	4	67%	4	100%	(0.06)	12	92%	17	89%	8	67%	(0.16)
No	7	16%	0	0%	1	7%	4	40%	2	33%	0	0%		1	8%	2	11%	4	33%	
Total	44	100%	9	100%	15	100%	10	100%	6	100%	4	100%		13	100%	19	100%	12	100%	
Panel B: If the answer of the question Q20a is "No", What is the reason(s)?																				
Lack of awareness of the role of the stock market	4	80%	0	0%	1	100%	2	67%	1	100%	0	0%	(0.72)	1	100%	1	100%	2	67%	(0.72)
Lack of awareness and confidence in the credibility of Libyan Stock Market	1	20%	0	0%	0	0%	1	33%	0	0%	0	0%		0	0%	0	0%	1	33%	
Total	5	100%	0	0%	1	100%	3	100%	1	100%	0	0%		1	100%	1	100%	3	100%	

Note: SF: Services Firms; MF: Manufacturing Firms; OG: Oil&Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response; Kruskal-Wallis's P-Value <0.05 : there is significant different between the groups.

Appendix C, Table 12: Consider that the Libyan Stock Market as Source of Funding in the Future.

Panel A: Does your firm consider that the Libyan Stock Market will be a source of funding for your firm in the future?																				
	Total		Sectors										Kruskal-Wallis's test P-Value	Firm's Size Groups						Kruskal-Wallis's test P-Value
			SF		MF		OG		FI		FF			Small		Medium		Large		
	N	%	N	%	N	%	N	%	N	%	N	%		N	%	N	%	N	%	
Yes	**37**	**84%**	6	67%	8	53%	5	50%	1	17%	3	60%		5	38%	12	60%	6	50%	
No	**7**	**16%**	2	22%	7	47%	4	40%	5	83%	2	40%	0.564	7	54%	7	35%	6	50%	0.489
Neutral			1	11%	0	0%	1	10%	0	0%	0	0%		1	8%	1	5%	0	0%	
Total	**44**	**100%**	**9**	**100%**	**15**	**100%**	**10**	**100%**	**6**	**100%**	**5**	**100%**		**13**	**100%**	**20**	**100%**	**12**	**100%**	
Panel B1: What is the type of the potential financial product(s)?																				
1.Issuing new shares	**7**	**30%**	1	17%	3	38%	2	40%	1	100%	0	0%		0	0%	3	25%	4	68%	
2.Issuing bonds	**1**	**4%**	0	0%	0	0%	1	20%	0	0%	0	0%		0	0%	1	8%	0	0%	
3.Offering part of the existing capital for public subscription	**1**	**4%**	1	17%	0	0%	0	0%	0	0%	0	0%	0.205	0	0%	1	8%	0	0%	**0.039**
Two Products {1,2}	**4**	**17%**	0	0%	1	13%	2	40%	0	0%	1	33%		1	20%	2	17%	1	16%	
Two Products {1,3}	**6**	**26%**	1	17%	3	38%	0	0%	0	0%	2	67%		2	40%	3	25%	1	16%	
Three Products {1,2,3}	**4**	**17%**	3	50%	1	13%	0	0%	0	0%	0	0%		2	40%	2	17%	0	0%	
Sector Total	**23**	**100%**	**6**	**100%**	**8**	**100%**	**5**	**100%**	**1**	**100%**	**3**	**100%**		**5**	**100%**	**12**	**100%**	**6**	**100%**	
Panel B2: The potential financial products Separately.																				
1.Issuing new shares	**21**	**91%**	5	83%	8	100%	4	80%	1	100%	3	100%		5	100%	10	83%	6	100%	
2.Issuing bonds	**9**	**39%**	3	50%	2	25%	3	60%	0	0%	1	17%		3	60%	5	42%	1	16%	
3.Offering part of the existing capital for public subscription	**11**	**48%**	5	83%	4	50%	0	0%	0	0%	2	33%		4	80%	6	50%	1	16%	

Note: SF: Services Firms; MF: Manufacturing Firms; OG: Oil&Gas Firms; FI: Food Industries; FF: Financial Firms; %: Percentage within the group; N= Number of Response; Kruskal-Wallis's P-Value <0.05 : there is significant different between the groups.

Mann-Whitney test				Mean Rank	
Combinations of potential financial products	**E1-E2**	**E1-E3**	**E2-E3**	**E3**	**E1**
P-Value	0.105	**0.018**	0.132	3.92	8.5

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different; E1: Small; E2: Medium; E3: Large.

Appendix C, Table 13: Islamic Finance

	Total		Sectors										Kruskal-Wallis's P-Value	Firm's Size Groups						Kruskal-Wallis's P-Value
			SF		MF		OG		FI		FF			Small		Medium		Large		
	N	%	N	%	N	%	N	%	N	%	N	%		N	%	N	%	N	%	
Panel A1: Has your firm Used Islamic Finance previously?																				
Yes	**3**	**7%**	1	11%	2	13%	0	0%	0	0%	0	0%	(0.62)	0	0%	2	11%	1	8%	(0.50)
No	**41**	**93%**	8	89%	13	87%	10	100%	6	100%	4	100%		13	100%	17	89%	11	92%	
Total	**44**	**100%**	**9**	**100%**	**15**	**100%**	**10**	**100%**	**6**	**100%**	**4**	**100%**		**13**	**100%**	**19**	**100%**	**12**	**100%**	
Panel A2: If the answer is "Yes", what is type of Islamic Financial product(s) were used?																				
Murabahah	**2**	**67%**	0	0%	2	100%	0	0%	0	0%	0	0%	(0.16)	0	0%	1	50%	1	100%	(0.48)
Rent to Owen	**1**	**33%**	1	100%	0	0%	0	0%	0	0%	0	0%		0	0%	1	50%	0	0%	
Total	**3**	**100%**	**1**	**100%**	**2**	**100%**	**0**	**0%**	**0**	**0%**	**0**	**0%**		**0**	**0%**	**2**	**100%**	**1**	**100%**	
Panel B1: Does your firm Consider Islamic Finance as its preferred source of funding?																				
Yes	**29**	**67%**	6	75%	11	73%	5	50%	4	67%	3	75%	(0.80)	9	75%	13	68%	7	58%	(0.61)
No	**13**	**30%**	2	25%	3	20%	5	50%	2	33%	1	25%		3	25%	6	32%	4	33%	
Neutral	**1**	**2%**	0	0%	1	7%	0	0%	0	0%	0	0%		0	0%	0	0%	1	8%	
Total	**43**	**100%**	**8**	**100%**	**15**	**100%**	**10**	**100%**	**6**	**100%**	**4**	**100%**		**12**	**100%**	**19**	**100%**	**12**	**100%**	
Panel B2: If the answer is "Yes", what is the reason(s) for this preference?																				
Religious Reason	**23**	**51%**	2	22%	10	67%	5	50%	4	67%	2	40%	(0.11)	7	54%	9	45%	7	58%	(0.91)
To Avoid Pay Interest	**16**	**36%**	3	33%	4	27%	4	40%	3	50%	2	40%		5	38%	7	35%	4	33%	
Risk Sharing	**14**	**31%**	4	44%	1	7%	4	40%	2	33%	3	60%		4	31%	7	35%	3	25%	
Looking for Partnership	**12**	**27%**	4	44%	3	20%	2	20%	1	17%	2	40%		3	23%	7	35%	2	17%	
Total	**45**	**100%**	**9**	**100%**	**15**	**100%**	**10**	**100%**	**6**	**100%**	**5**	**100%**		**13**	**100%**	**20**	**100%**	**12**	**100%**	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **%**: Percentage within the group; **N**= Number of Response; **Kruskal-Wallis's P-Value** < 0.05 : the groups are Significantly Different.

Appendix C, Table 14: What is the reason(s) for no reference of Islamic Finance?

Reasons	Total	Sectors		Firm's Size Groups	
		SF	OG	Small	Medium
1.Not apply with a source of funding for the National Oil Corporation	2		2	0	2
2.Failure of Islamic Finance current available to meet the requirements to Sharia Law	1	1		1	
3. The Risk resulting from changing the applied discount rates					
4.Absence of standards and principles agreed upon that determine the ways and methods of Islamic Finance					
Total	3	1	2	1	2

Note: **SF**: Services Firms; **OG**: Oil&Gas Firms.

Appendix C, Table 15: What are Project features which may influence usage of Islamic Finance?

Project features	Total	Sectors			Firm's Size Groups		
		SF	MF	FF	Small	Medium	Large
Relatively Large Projects	2	1	1		1	1	
Projects with relatively low risk for relatively short PB period & high rate of income	3		2	1	1	1	1
Housing projects and commercial real estate and infrastructure	1	1				1	
Total	**6**	**2**	**3**	**1**	2	3	1

Note: SF: Services Firms; **MF**: Manufacturing Firms; **FF**: Financial Firms.

Appendix C, Table 16: To what extent this group(s) attempts to influence the investment decision-making process in these firms.

Groups				Sectors										Kruskal-Wallis's test	Firm's Size Groups						Kruskal-Wallis's test
				SF		MF		OG		FI		FF			Small		Medium		Large		
	N	Mean	Mean's	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean		N	Mean	N	Mean	N	Mean	
	%	(P-Value)	Rank	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(%)	(P-Value)	(P-Value)
Economic & Financial Policy of the State	**10**	**4.000**	**1**	3	**4.667**	4	**3.750**	1	**3.750**	0	**0.000**	2	**3.500**	(0.44)	2	**3.000**	4	**4.500**	4	**4.000**	(19%)
	(22%)	(0.01)		(30%)	(0.04)	(40%)	(0.06)	(10%)	…….	(00%)	(0.00)	(20%)	0.795		(20%)	(1.00)	(40%)	(0.06)	(40%)	……...	
Accountant Practitioners	**42**	**2.310**	**2**	9	**3.222**	14	**2.000**	8	**2.125**	6	**1.667**	5	**2.600**	(0.16)	12	**2.833**	18	**2.278**	12	**1.833**	(17%)
	(93%)	(0.00)		(21%)	(0.65)	(33%)	(0.03)	(19%)	(0.09)	(14%)	(0.01)	(12%)	(0.59)		(29%)	(0.71)	(43%)	(0.03)	(29%)	(0.01)	
Fund Provider	**42**	**2.880**	**3**	9	**3.444**	14	**2.571**	8	**2.750**	6	**2.833**	5	**3.000**	(0.60)	12	**3.083**	18	**3.056**	12	**2.417**	(41%)
	(93%)	(0.56)		(21%)	(0.23)	(33%)	(0.25)	(19%)	(0.63)	(14%)	(0.74)	(12%)	(1.00)		(29%)	(0.78)	(43%)	(0.88)	(29%)	(0.11)	
Accounting & Financial Education	**41**	**2.730**	**4**	7	**4.000**	14	**2.357**	10	**2.800**	6	**1.667**	4	**3.250**	**(0.03)**	13	**2.923**	16	**2.938**	12	**2.250**	(39%)
	(91%)	(0.23)		(17%)	(0.04)	(34%)	(0.12)	(24%)	(0.62)	(15%)	(0.01)	(10%)	(0.79)		(32%)	(0.86)	(39%)	(0.86)	(29%)	(0.07)	
Total Mean		**2.740**		9	**3.643**	15	**2.435**	10	**2.620**	6	**2.056**	5	**3.000**		13	**2.948**	20	**2.875**	12	**2.350**	
		(0.00)		(20%)	**(0.00)**	(33%)	**(0.00)**	(22%)	**(0.00)**	(13%)	**(0.00)**	(11%)	**(1.00)**		(29%)	**(0.00)**	(44%)	**(0.09)**	(27%)	**(0.00)**	

Note: **SF**: Services Firms; **MF**: Manufacturing Firms; **OG**: Oil&Gas Firms; **FI**: Food Industries; **FF**: Financial Firms; **%**: Percentage within the group; **N**= Number of Response; **t-test** P<0.05 Indicates the mean is significantly different from the neutral position (3); **Kruskal-Wallis's** P-Value <0.05 : there is significant different between the groups.

Mann-Whitney test

Accounting & Financial Education	S1-S2	S1-S3	S1-S4	S1-S5	S2-S3	S2-S4	S2-S5	S3-S4	S3-S5	S4-S5
P-Value	**0.022**	0.054	**0.005**	0.423	0.319	0.363	0.325	0.063	0.563	0.121

Sig.(2-tailed) P-Value < 0.05: the two groups are Significantly Different.

Mann-Whitney Mean Rank

S2	8.86	**S4**	3.83
S1	15.29	**S1**	9.710

S1: Services Firms; S2: Manufacturing; S3: Oil&Gas; S4: Food Industries; S5: Financial Firms.